DOCUMENT RESUME

ED 087 146 EC 061 023

AUTHOR	Elkins, J., Ed.
TITLE	The Identification and Treatment of Children with Learning Disabilties.
INSTITUTION	Queensland Univ., Brisbane (Australia). Fred and Eleanor Schonell Educational Research Centre.
PUB DATE	73
NOTE	86p.
EDRS PRICE	MF-$0.65 HC-$3.29
DESCRIPTORS	Adolescents; Childhood; *Conference Reports; Diagnostic Teaching; *Exceptional Child Education; Foreign Countries; *Identification; Individualized Instruction; *Learning Disabilities; Minimally Brain Injured; Neurology; Perceptually Handicapped; *Special Education; Trend Analysis
IDENTIFIERS	Australia

ABSTRACT

Presented are nine papers given at a 1973 seminar at the University of Queensland in Australia on the identification and treatment of children with learning disabilities. Noted are recommendations of the Senate Standing Committees on Handicapped Persons and Teaching Education which would require increased numbers of trained teachers and other professionals. Included papers have the following titles: "Some World Trends in the Diagnosis and Treatment of Children with Learning Problems", "School Problems and the Neurologist", "Children with Reading Disabilities", "Helping the Adolescent with Learning Problems", "Organization and Implementation of Individualized Programs Within the Framework of a Junior High School", "Auditory Immaturity as an Educational Handicap", "Prescriptive Teaching of Children with Learning Disabilities", "A Developmental Approach to Identification and Treatment of Children with Minimal Cerebral Dysfunction", and "Queensland Provision for Children with Learning Disabilities -- Performance and Promise". (DB)

IE IDENTIFICATION AND TREATMENT OF

CHILDREN WITH LEARNING DISABILITIES

U.S. DEPARTMENT OF HEALTH
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

Edited by

J. ELKINS

RSD AND ELEANOR SCHONELL EDUCATIONAL RESEARCH CENTRE

UNIVERSITY OF QUEENSLAND

ED 087146

THE IDENTIFICATION AND TREATMENT OF CHILDREN WITH LEARNING DISABILITIES

Edited by

J. ELKINS

FRED AND ELEANOR SCHONELL EDUCATIONAL RESEARCH CENTRE
UNIVERSITY OF QUEENSLAND

1973

FOREWORD

Popular and professional interest in children's learning problems has never been more intense. The Fourth Annual Seminar in Special Education of the Fred and Eleanor Schonell Educational Research Centre, held at the University of Queensland in May, 1973, bore witness to this widespread concern. Registrations were almost double those of previous seminars. The Seminar followed upon the attendance of more than 800 at the inaugural Sir Fred Schonell Memorial lecture in April by Professor Samuel A. Kirk. The needs of exceptional children and solutions to the problems of helping these children are undergoing critical appraisal in Queensland at the present time.

The importance of the dissemination of information which will aid in the identification of children's learning difficulties can be gauged by the recommendations of the Senate Standing Committees on Handicapped Persons and also Teacher Education. If implemented, these recommendations will require considerable numbers of trained teachers and related professionals.

Papers in this seminar were presented by teaching staff of the University of Queensland, by teachers and administrators concerned with special education, and by workers in related professions.

* * * * * *

CONTENTS

Chapter		*Page*
	Foreword	iii
1.	Some world trends in the diagnosis and treatment of children with learning problems - R.G. Cochrane.	1
2.	School problems and the neurologist - D.B. Appleton.	11
3.	Children with reading disabilities - J. Elkins.	18
4.	Helping the adolescent with learning problems - M.R. Ellis Robinson.	33
5.	Organization and implementation of individualized programs within the framework of a Junior High School - Sister Margaret.	44
6.	Auditory immaturity as an educational handicap - A.N. Lewis.	47
7.	Prescriptive teaching of children with learning disabilities - J.K. Atkinson and V. Patricia Gunn.	58
8.	A developmental approach to identification and treatment of children with minimal cerebral dysfunction - Yvonne R. Burns.	67
9.	Queensland provision for children with learning disabilities : performance and promise - G.F. Berkeley.	78

* * * * * *

CHAPTER 1

SOME WORLD TRENDS IN THE DIAGNOSIS AND TREATMENT OF CHILDREN WITH LEARNING PROBLEMS

R.G. Cochrane

(Fred and Eleanor Schonell Educational Research Centre)

This grand title *prima facie*, covers the whole world. Actually, it covers only a small portion of the English speaking world recently visited. Australia, though seized with the importance of learning disability, gets perhaps expectably the most superficial treatment.

Australian educational authorities do realise the importance of the field of learning disability: so do parents. SPELD in Queensland and other states, is very lively, and SPELD in Queensland has recently given the University of Queensland $20,000 which has made possible the appointment of a professor of special education who will direct the Fred and Eleanor Schonell Educational Research Centre. The Centre staff hopes for further increases in staff and equipment so that more comprehensive and concentrated research can be initiated. It would be very satisfactory if we could have, for example, a research professor and staff whose activities were limited to research. This is not to deny the need for the traditional clinical examinations, treatment, teaching, and research activities of a University department. The Schonell Centre also needs increased clinical manpower. Incidentally, the late Sir Fred would have been delighted with seminars concerning learning disabilities. Throughout Australia, there are many other professional bodies, interested in the problem of learning disability.

However, one must not be misled into the belief that because no nominal body, professional or community, exists, work is not done in this field. One Canadian deputy director of a city school system spoke bitterly about a very well-known voluntary organization. His city's provisions for the learning disabled, however, were excellent. Also, his department employed five psychiatrists, seventy psychologists and sixty social workers in addition to educational specialists, paediatricians, and people from other disciplines.

The United States.

In the United States, the community movement is strong. There are such bodies as the Californian Association for Neurologically Handicapped Children, (CANHC) whose latest bulletin has an article advocating a change in direction of drive by the CANHC-ACLD combination from the academic area towards the social area, as SLD children have more difficulties in the former. The Association for Children with Learning Disabilities (ACLD), with over 20,000 parents, has international affiliations. Also with international affiliations is the Council for Exceptional Children (CEC) for whom learning disability is one of the specialties.

The Association for Children with Learning Disabilities held their 10th International Conference at Detroit, Michigan on March 14th to 17th, 1973. A look at the agenda gives some idea of the deliberations and emphasises the ramifications of the treatment of learning disability.

Firstly, a press release states that the conference concerned children with "specific learning disabilities of a perceptual, conceptual or co-ordinative nature".[1] Then, like many American conferences, there were pre-conference specialist seminars. A listing of some of the topics and their disciplines indicates some of their preoccupations:

MEDICAL	Causes Neurochemical changes Pathology Child Developmental Diagnosis Behavioural Aspects Medical Treatment The Influence of Medical Information on Educational Techniques
PSYCHOLOGY	Roles Dimensions of Early Learning Diagnosis The Relationship between Theoretical and Practical Issues
EYE AND VISUAL	How We See Visual Perceptive Deficits Educational Efficiency of Optometric Training Ophthalmological Terms
ELEMENTARY TEACHING	The Mojave Project Maths Manipulatives and other subjects
DIAGNOSIS	Do Visual Motor Tests Measure Visual Perception? Assessment Using the Teacher
MINORITY AND URBAN	Problems in an Urban Program To Fund or not to Fund? Materials, People and the "Open Clock" Room In Teacher Training, Who's Teaching What to Whom?
PARENTS, VOLUNTEERS, FAMILY, COMMUNITY	Child Guidance Clinics Community Public Relations
PRE-SCHOOL	Planning on a State-wide Basis

1. ACLD News Release, Detroit, March 1, 1973.

SECONDARY TEACHING

The Experience Centre
Learning Disability and the Adolescent Child

These sectionalised topics interest particular groups. As well as these, other conference topics included strategies, training, theories, projects, screening, disability in secondary school, social aspects, video-tape feedback for development of self-image through psychodrama and role playing, labelling, perceptual motor-activity, recreation, multidisciplinary activity, reason for teaching reading, programming, concept formation, ethnology, parents, tutoring, individual difference, language development, organization, techniques, materials, memory, group-training, regular class treatment, prescriptive teaching, resource personnel and rooms, computer assisted diagnosis, innovative programmes, corrective reading, behavioural analysis, articulation, cognitive style, hyper-kinesis, genetics, modalities, task analysis, decision making, volunteers, delinquency, the alphabet, research, decoding, the multi-sensory approach, emotional disturbance, outdoor education, visual education, style, error analysis, summer camps, laboratories - and even Yoga!

Some readers may recognise all of the above although they may be wearing slightly jargonised hats, but one must admit the comprehensive nature of the coverage of a *very heterogeneous* group.

Definition

And how many of this heterogeneous group of children are there? Without precise definition it is impossible to say. One 1968 definition by the National Advisory Committee to the Bureau of Education for the Handicapped, Office of Education, is

> "Children with special learning disabilities exhibit a disorder in one or more of the basic psychological processes involved in understanding or in using spoken or written language. These may be manifested in disorders of listening, thinking, talking, reading, writing, spelling, or arithmetic. They include conditions which have been referred to as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, developmental aphasia, etc. They do not include learning problems which are due primarily to visual, hearing, or motor handicaps, to mental retardation, emotional disturbance or to environmental deprivation."
>
> (Hammill and Bartel, 1971,p.6)

It will be noted that this definition emphasises the basic psychological processes involved in language. It covers the basic school subjects as well as listening, thinking and talking. It includes perceptual handicap, brain injury, brain dysfunction, developmental aphasia, dyslexia, etc.; and *excludes* learning problems due primarily to sensory or motor handicaps, mental retardation, emotional handicap or environmental deprivation.

Another definition permits the inclusion of emotional or behavioural disturbance as causes. Still another insists on association with deviations of function of the central nervous system. Another merely permits the inclusion of neurologically related conditions, and still another speaks of a general discrepancy between actual and expected achievement.

Incidence

While there is this variability of definition, there is, of course, variability of estimate of incidence. The Bureau of Education for the Handicapped in the USA estimates slightly more than 10 per cent of atypical children in all categories of handicap with one per cent having learning disabilities (Kirk, 1972, p.24). The ACLD estimates that "approximately seven per cent of all school-age children in the country have a severe enough learning disability to require special attention". Professor Kirk (Kass, 1970) notes "that the National Advisory Committee for Handicapped Children...has stated that specific learning disabilities in federal legislation constitute the hard-core group and consist of about 1 - 3% of the school population" p.109. The California Education Code, sec. 6752 and 6755 states,

> "School districts operating programs for educationally handicapped minors may not enrol at any given time more than 2 per cent of the school district enrolment in such programs."[2]

It seems that an estimate of two per cent hard-core might be a reasonable estimate of children with learning disabilities. However, if the degree of learning disability is graphically plotted against numbers of children, then you can draw the line where you like and thus get whatever incidence you are after.

Remediation and research

The Schonell Centre is not so much concerned with incidence as with characteristics and remediation. An Australian Research Grants Committee project in 1972 endeavoured to find out how both succeeding and failing children perform in many situations. Not all the commonly held beliefs about children with reading disability are being upheld. Other Australian universities, state departments, colleges of advanced education and teachers' colleges are carrying out projects. There is a need for the collation of findings. It is hoped, too, that research accepts Kirk's recommendations concerning the questions to be asked:

> We have spent too much time trying to answer the question - Is the child mentally retarded, or is he dyslexic, or is his brain injured or autistic? It is more advantageous to ask what the child's abilities and disabilities are so that we can organise an appropriate instructional program for him.
>
> (Kirk, 1973)

---

2. Department of Health, Education and Welfare, Public Health Service, N & SDCP Monograph. Minimal Brain Dysfunction in Children, 1966, p.47.

Bodies vitally concerned, those mentioned before, plus the Special Schools Association, the Queensland Remedial Teachers' Association, and, particularly notable for its publications, the Victorian Remedial Teachers' Association will do well to follow Kirk's advice.

The Queensland Education Department's provision of remedial teachers grows each year and a Remedial Teachers' Course has been established at the Mt. Gravatt Teachers' College. Remedial teachers in the State Department now number over forty.

John McLeod and Jonathan Anderson, both previously with the Schonell Centre, have published widely on readability, information transmission, the *cloze* procedure and correlates of reading disability.

The United Kingdom

Switching for a moment to the UK field, one of Her Majesty's Inspectors once said that England did not have many outstanding provisions for atypicality, but had a pretty adequate coverage for most types of children. One of the impressive things about the UK scene is its flexibility of provision. For example, a Local Education Authority (LEA) may not have a particular facility, but a neighbouring LEA does, so suitable arrangements are made. Or no LEA may have this facility, but there is a suitable private institution. It is quite likely that the LEA will pay the requisite fees.

Labels are often not very much in favour in the United Kingdom. A British Government report (1972) warned:

> "Unless a 'specific developmental dyslexia' group could be positively and very precisely differentiated, there is a danger that attention would focus on the group assessed as 'dyslexic' to the disadvantage of those with perhaps equally severe difficulties but who happened not to be so assessed." (p.3)

The report from which the above was taken goes on to say that the term "dyslexia" has been used so loosely and misleadingly, that the Committee thought it better to use the term "specific reading difficulties".

The Inner London Education Authority educates nearly a half-million pupils. There are some "remedial schools", but there are nominally no classes for specific learning disability. This is because there is considerable uncertainty about the term. One may find, however, many schools and centres where adequate provision is made for learning disability.

One remedial centre (Kirkdale at Leytonstone) appeared to have just about the complete community unit in the one building: family planning, marriage guidance, medical research, a sociological unit, a child and family psychiatric service, the school psychological service and the "tutorial unit" (the remedial centre), serving one-third of the Borough of Waltham. The tutorial unit was being moved to the centre for the teaching of English to immigrants. It was, however, to be called a *Learning Disability Centre*.

A feature of the Inner London Education Authority (ILEA) is its 1,100 to 1,200 courses for teachers each year.

Two people working in New York who exemplify a treatment dichotomy are Lilyan Ruderman, Coordinator of Learning Disabilities Program, Herbert H. Lehman College, City University of New York, and S. Alan Cohen, Associate Professor at Yeshiva, but spending most of his time as Director of Random House Educational Systems Division. Dr. Ruderman has been very comprehensively trained, was helping with the restandardization of the Wechsler Scale for Children (WISC), adopted a whole family approach in clinical situations and also was participating in a narcotics visiting programme. She said that New York State had not yet accepted the classification of Specific Learning Disability (SLD). Connecticut recognised the "neurologically impaired". New Jersey had accepted SLD. As could be expected Ruderman has a very global, interdisciplinary approach, and the child's "significant others" are involved in the treatment.

On the other hand, Cohen would call himself a "no-nonsense" educational systems engineer. He states that estimates of skills underlying reading range from about 500 to 18,000. Cohen works with 475 objectives. His Division enters into contracts with educational authorities. At the time of my visit he had 300 "installations" with educational authorities and claimed 85 per cent success. At the same time he had 57 centres for Chicano migrant workers.

Apart from the contractual nature of operations of this Division, the chief factors involve goal analysis, problem solving, defining objectives, observation of the laws of learning, internal reinforcement through instant feedback, and programming involving very small bits of learning. The procedure is for himself plus another couple of staff to visit a school to make the "installation". Cohen claims that, in three days, the staff can be made capable of administering the system, and that one teacher can look after thirty children! He prefers ordinary class teachers to remedial teachers, as he says that the latter often have too rigid an approach. He concentrates on decoding, and the system doesn't cover spelling or composition. Doubtless systems for these will be developed in future. He regards the ITPA merely as another labelling device. All of this does not reduce the tremendous amount of work he has done in the community, but his view now is pretty severely behaviourist.

Another instance of a systems contracting unit is Engelmann and Becker Inc. in Eugene, Oregon. Like Cohen, these people are emphatic behaviourists, but unlike him they do not bother listing the objectives. They maintain that this sort of thing becomes more substantial than the programme itself. In front of the relevant section of the University of Oregon at Eugene is a great sign, HEADSTART FOLLOW THROUGH PROGRAMME - ENGELMANN BECKER MODEL. Despite the blurb, their scheme is legitimate, and education authorities provide up to $500 per child for their programme. (There was a notice in a University lift that the DISTAR programme had been cancelled for that summer. Whether this indicated a decline in popularity, or increased preoccupation with Engelmann Becker Inc., is unknown.)

Lest Cohen be considered a mere mercenary opportunist, it must be noted that he has done much good work with New York's urban minorities, and he has a

tremendously practical approach. In a paper entitled *Minimal Brain Dysfunction and Practical Matters such as Teaching Kids to Read* (Cohen, 1972), he lists five conclusions:

(1) Labels are useless.

(2) Behaviours, not constructs, are real.

(3) The aetiology of a child's learning problem is usually irrelevant to teaching him to read.

(4) Laws of learning are more effective than theories of development.

(5) Theories are not designed for clinicians.

Some of Cohen's 475 objectives under the main headings of Word Study, Vocabulary, Comprehension and Work Study Skills, are under headings quite familiar to the remedial teacher: auditory discrimination, alphabet knowledge, visual discrimination, encoding, sight words, beginning consonants, beginning blends, beginning digraphs, ending consonants, ending blends, medial consonants, position of consonants, final -le, long and short vowels, etc., etc. Vocabulary tasks include: compound words, contractions, prefixes, suffixes, roots and affixes, possessives, homonyms, antonyms, etc. Comprehension includes: context clues, basic comprehension, details, main ideas, inferences, cause and effect, etc. Work/study skills include: learning centre procedures, following directions, listening, oral reading, rate of reading, dictionary skills, reference skills and so on. This High Intensity Learning System involves over 75 varieties of materials drawn from over 30 different publishers - expensive for the schools, but by no means monopolistic for Random House.

Whereas Cohen, Engelmann and Becker might be called aggressive behaviourists, Hewett and Keogh at the University of California, Los Angeles Branch (UCLA) could be described as non-aggressive behaviourists. Their main concern is extracting what is good from all forms of specialist teaching, so that some comprehensive suggestions can be made. They are finding that so much of what they extract just comes under the heading of "good teaching".

In Hewitt's remedial teaching, and despite professorial status, he still does some, he speaks of some of the divisions in teaching as "molecular phantasy", and believes in "teaching a child to read". He believes in a very pragmatic sort of motivation in the remedial process: "If the child is doing happily what he (Hewitt) wants him to do, then that child is motivated and will probably cure himself." He also is a great believer in the child's "self-concept" but objects to "wallowing in children's psyches. You must do with what you have". Barbara Keogh very ably assists Hewett, and adopts a learning-task orientation. Keogh found the Bender-Gestalt to be a useful predictor of school achievement in the upper primary grades. She would agree that only the most severely affected children should be classified as having a learning deficit. With others, a mere change in situation, e.g. a different teacher, a different instructional strategy, different content, or change in reinforcers, may remedy matters. According to her "Most school psychologists' reports are chronicles of disaster". "Lost in the diagnosis is consideration of what the child can do." Teachers need to know what the child can do as well as what he can't do. Then there is some chance of remedying deficiencies.

When Professor Samuel Kirk moved from Urbana to Tucson, Arizona, the latter city started to become a centre for the study of learning disability, and in the University of Arizona's Department of Special Education there is a Leadership Training Institute in Learning Disability, which has produced a very informative report on how to attempt solutions to the problem. Over 90 US leaders participated, Corrine Cass being director. A late mover to Tucson has been James Chalfant, originally from Urbana. Chalfant follows an acceptable procedure: product analysis, then procedural analysis, then process analysis, then psychological analysis. Kirk would not necessarily agree with this order. Professor Dale Bryant, recently returned to Columbia Teachers College, assisted with a summary of the present state of knowledge of learning disability for the US federal government.

Any account, no matter how fragmented, about developments in the USA, must mention the three task-force monographs produced for the Federal Government. They are a little old now, but present as balanced a treatment as is available (Clements, 1966, 1969; Chalfant and Sheffelin, 1969).

So far this paper has been rather a ramble through isolated situations and recommendations, and not much of a disquisition on "World trends in the diagnosis and treatment of children with learning problems". Some of the trends, however, can be detected.

First there is a world-wide trend towards retaining children in the ordinary class-room: integration rather than segregation. This, of course, presupposes adequate resource personnel and material, the use of teacher-aides, in-service training of teachers, and more adequate pre-service training of teachers. The Canadian Committee of the Council for Exceptional Children (1971) envisages teacher training at 3 levels:

(1) basic orientation for all teachers with recognition of exceptional children and an orientation to diagnostic teaching;

(2) preparation of generalists in the education of exceptional children, these generalists acting as master diagnostic teachers and consultants to regular classroom teachers; and

(3) specialization in area of exceptionality and participation in the inter-disciplinary team.

Second, is the insistence on behavioural analysis, both of what teachers and children do. This is time-consuming and expensive, but is about the only way in which objective judgment can be exercised in teaching and in child performance. Task analysis provides objectives for teachers and necessitates less dependence on theory.

Third, there is a healthy behavioural view, demanding objectives and adequate recording of base-line data. What a child can and cannot do must be recorded, and adequate procedures set up to obviate the deficiencies. In this connection there is a wide-spread emphasis on criterion sampling. Such a famous name as D.C McClelland writes in the January, 1973 issue of *The American Psychologist* on "Testing for Competence rather than for Intelligence". There is greater faith in the validity of observed behaviour than in constructs, and there is questioning of, and an attempt to improve, teaching method.

Fourth, and possibly as a backlash against extreme behaviourism, there is increased emphasis in most areas on what can be called the correlates of disability - psychological, sociological and medical.

Fifth, testing is becoming much more functional than quantitative. It is not very profitable for a parent to be told that his boy is two years behind. He knows it! Or that his phonic skills are weak. He probably knows that too! But, if he is told that he can do this but can't do that, and this is the way to fix the latter, then some real help is added.

Sixth, there is increasing acceptance of specific learning disability as an entity, but without exaggerated estimates of incidence and without the inclusion as criteria of very moderate conditions.

Seventh, there is a doctrine of accountability. Although one may object violently to some aspects of this, the doctrine at least calls attention to the fact that vast sums cannot be paid in education without some assurance that the money is well spent. There is some value in cost accounting. Teachers may be interested in a Dade County experient[3] where some teachers risked some capital expenditure losses concerning 174 disadvantaged pupils, but were able to more than double reading and arithmetic gains obtained through a behavioural research laboratory scheme, and were able to halve, and, in one case, reduce by two-thirds, the cost of a month's gain. The teachers netted $23,000! Not bad for a combination of professional inventiveness and financial skill!

Eighth, there is an increase in performance contracting. Whether this is good or bad is debatable.

Ninth, there is a decrease in categorisation, and an increase in appreciation of the properties of the normal curve. You can draw the line anywhere you like, so that arguments concerning incidence are useless.

And tenth, there is a growing interest in language, particularly in linguistics. And there is probably more mature use of the language of communications.

Eleventh, there is increasing co-operation between parents and professional advisers - a nice combination for progress.

Twelfth, there is increasing emphasis on prevention, so that early screening is becoming more popular.

Thirteenth, there is increasing emphasis on the social correlates of learning disability, and less emphasis on the academic.

Fourteenth, the computer and information and communications science are being increasingly used, with many innovative programmes.

And finally, community sources are being increasingly used, with a rational employment of many different skills.

---

3. Reported in *Education Abstract*, Research and Curriculum Branch, Queensland Education Department, February 1973 (from Phi Delta Kappan, November 1972).

REFERENCES

CHALFANT, J.C. & SCHEFFELIN, M. *Central processing dysfunctions in children.* Phase three of a three-phase project. NINDS Monograph No. 9. Washington, D.C.: U.S. Government Printing Office, 1969.

CLEMENTS, S.D. *Minimal brain dysfunction in children.* Phase one of a three-phase project. NINDB Monograph No. 3. Washington, D.C.: U.S. Government Printing Office, 1966.

CLEMENTS, S.D. *Minimal brain dysfunction in children.* Phase two of a three-phase project. N&SDCP Monograph. Washington, D.C.: U.S. Government Printing Office, 1969.

COHEN, S.A. *Minimal brain dysfunction and practical matters such as teaching kids to read.* Paper at Conference on Minimal Brain Dysfunction, N.Y. Academy of Sciences. National Institute of Child Health and Human Development and National Institute of Neurological Diseases and Stroke. Biltmore Hotel, N.Y., 22nd March, 1972.

DEPARTMENT OF EDUCATION AND SCIENCE. *Children with specific reading difficulties.* London: H.M.S.O., 1972.

HAMMILL, D.D. & BARTEL, N.R. *Educational perspectives in learning difficulties.* New York: Wiley, 1971.

KASS, C.E. *Final Report U.S.O.E.* Contract No. OEG-0-9-121013-3021 (031) *Advanced Institute for Leadership Personnel in Language Disabilities 1970,* Dept. of Special Education, University of Arizona, Unit on Language Disabilities, Bureau of Education of the Handicapped, U.S. Office of Education.

KEOGH, B.K. Psychological evaluation of exceptional children : old hang-ups and new directions. *Journal of School Psychology.* 1972, *10,*141-145.

KEOGH, B.K. & SMITH, C.E. Visuo-motor ability for school prediction: a seven year study. *Perceptual and Motor Skills,* 1967, *25,* 101-110.

KIRK, S.A. *Educating exceptional children* (2nd ed.) Boston: Houghton-Mifflin, 1972.

KIRK, S.A. The education of intelligence. *The Slow Learning Child,* 1973, *20(2)* (in press).

QUEENSLAND DEPARTMENT OF EDUCATION, Research & Curriculum Branch, *Education Abstract,* February, 1973, (from *Phi Delta Kappan,* November, 1972).

THE CANADIAN COMMITTEE, THE COUNCIL FOR EXCEPTIONAL CHILDREN *Standards for educators of exceptional children in Canada.* Toronto: National Institute for Mental Retardation through Leonard Crainford, 1971.

* * * * * * *

CHAPTER 2

SCHOOL PROBLEMS AND THE NEUROLOGIST

D.B. Appleton
(Clinical Supervisor, Department of Child Health,
Royal Children's Hospital, Brisbane)

Some American surveys have suggested that as many as twenty percent of school children have a problem in learning which would benefit from remedial activities. This figure, of course, spans the population of poor readers, late readers, slow readers, near-illiterates, hopeless spellers and mirror writers, dysgraphics, dysphasics, poor speakers. In addition to this, there are present in many classes children with organic conditions which, of themselves, or, as a result of their treatment, impair a child's performance at school. Of particular interest here is *petit mal* epilepsy which may go completely unrecognized until poor concentration, or lapses of concentration are observed by the school teacher.

Many of the advances in the understanding of some of these problems have come from psychologists with the development of special testing procedures. Very few physicians seem to be actively interested in these problems. This may well reflect the paucity of clinical signs to be found in most of these children.

Investigative work in humans is hampered by the inability to localise various functions to specific parts of the brain by direct measures. Most of our knowledge comes from observation of the effects of injuries or vascular accidents or tumours and correlation with post-mortem findings. Intra-arterial injection of barbiturates has also helped in some degree. Both of these situations are quite abnormal and the specificity of the dynamic disturbance must be in doubt. Since animals do not have the sophisticated skills under discussion here, animal experimentation has little to offer.

With this background, then, what does a neurologist have to contribute to the management of a child who is doing poorly at school? I have already said that clinical signs are few, but there may well be reflex abnormalities, changes in tone, extensor plantar responses, motor incoordination and other "soft" signs suggesting diffuse brain damage may be present. Into this group would fit the children with minimal cerebral dysfunction (Orton, 1937), also variably called minimal brain damage (Strauss and Lehtimen, 1947) or minimal cerebral injury (Gesell and Amatruda, 1941) to name but a few.

The problem has been discussed at length and the task force organized by the National Institute of Neurological Diseases and Blindness, Division of Chronic Diseases of U.S. Public Health Service, National Society for Crippled Children (Clements, 1966) concluded:

> "The syndrome refers to children of near average, average or above average intelligence with learning or behavioural abnormalities ranging from mild to severe which are associated with subtle deviant

> function of the nervous system. These may be characterised by combinations of deficits in perception, conceptualisation, language, memory, control of attention, impulse or motor function.
>
> Similar symptoms may complicate the problems of children already compromised by cerebral palsy, epilepsy, mental retardation, blindness or deafness."

The cause is usually not found, but careful history of the pregnancy, perinatal and early post-natal period is imperative. Genetic variations, biochemical abnormalities, perinatal illnesses or injuries sustained during the critical years of brain development and maturation may be causative factors.

Presentation

Few of the children with this syndrome present before attendance at school. Those who do so are usually referred because they are hyperactive and difficult to manage at home. They are often unaware of dangers, poorly tolerated by their peers and have an extremely short attention span. More rarely there is delayed motor development or even excessively advanced motor activity.

Most present for a medical opinion when the teacher at school notices "something wrong". One hesitates to reflect on some early schooling days and the memory of several who were restless and "bottom of the class" and encouraged to greater endeavour by frequent use of corporal punishment. Those days are hopefully passed.

The short attention span will very often cause disruptive behaviour with consequent upset of the learning of other children in the class as well as restriction of learning to a degree less than indicated by assessment of intellectual capability in the child concerned. School difficulty will frequently produce emotional upset and this will further complicate the picture.

Investigation

Psychological testing is important and the most prominent feature is a disparity between verbal and performance levels. The poorest abilities will usually be in perception and visual-motor coordination.

Electroencephalography may reveal abnormalities of rhythm or rate in a small proportion. Frank seizure activity occurs less frequently.

Incidence

American surveys again suggest an incidence as high as 5% of children are classifiable into this disorder (Schechter, 1971). This compares with about 0.5% for epilepsy and cerebral palsy. The prevalence will, of course, depend on the strictness of diagnostic criteria applied.

Already mentioned are the "soft" neurological signs of minor reflex changes, alterations in tone and extensor plantar responses which occasionally

occur. These signs are the same as those present in cerebral palsy, but in that condition they are very much more severe. It is suggested by some that the clumsiness and other abnormalities of neurological function are subclinical forms of cerebral palsy and the psychological testing irregularities is the result of minimal mental retardation (Paine *et al*, 1968). This suggests an organic basis for the conditions under discussion.

Further evidence for this comes from a study of the mothers' pregnancies, labours and an increased incidence of neonatal problems in this population compared with the whole population. This does not mean that some abnormality is present in every case - in fact, in fewer than 50% would such a history be obtained.

It must be stressed that the child who has a progressive or treatable organic cerebral lesion is very rare indeed, and for this reason the physician has a less important part to play than the psychologist and educator who must plan ways and means of overcoming the problems which these children present. Sometimes, drug treatment can be most helpful and this will be discussed later.

In an attempt to detect children with this spectrum of disorders earlier and so hopefully prevent many secondary problems from arising, special registers of "high risk children" have been established, in fact, by law in certain parts of England. Into this register would go those where the pregnancy, birth or neonatal period showed any irregularities, and these children would be carefully assessed by skilled paediatricians from time to time to determine if any abnormalities become evident. Experience so far has been disenchanting. The pick-up rate does not justify the large expenditure of time and resources involved.

Treatment

The physician is probably in the best position to explain the problem to parents, to discuss with them reassuringly that improvement usually occurs with time, that drug treatment may have a part to play, that educators now are more enlightened and that some advances are being made in provision of special remedial classes, and generally to support the parents in handling children who, at times, can be most trying indeed.

One of the natural reactions to a very active child might be to suggest that a mild sedative be given "to settle things down". The most common sedatives in general usage in our population would be the barbiturates, of which *Phenobarb* and *Amytal* are examples. Unfortunately, the barbiturates paradoxically produce hyperactivity in even normal children and exacerbate the hyperactivity in those already exhibiting this problem. It is reasonable to suggest that these drugs are absolutely contra-indicated in this situation.

Just as barbiturates have a paradoxical action, so do the stimulants such as dexamphetamine and methylphenidate *(Ritalin)* which produce a calming effect thought perhaps to result from improved integration of brain function consequent upon increased alertness. Since dexamphetamine has a marked appetite suppressant effect, it is probably better to use Ritalin in the first

instance and this can be given in low dosage initially morning and midday. The effect will be wearing off by night so that natural sleep can occur. One of the problems with these drugs is that tolerance occurs fairly readily with resultant requirement for increased dosage to achieve a satisfactory result. To overcome this, it is worthwhile giving the drug only on school days and stopping it altogether during holidays. (Parents are often not too pleased with this if behaviour has improved with treatment.)

A further problem arises in these days of drug abuse and several instances of the stimulants being used by other members of the families are known.

Perhaps the most commonly used preparations at present are the phenothiazines and *Melleril* is representative of these. They are not quite as effective as the stimulants which are beneficial in about 50% of cases. Long term side effects can occur such as retinal pigmentation, dyskinesias and Parkinsonian syndromes and these can be permanent. The dosages required to produce these reactions are usually higher than those used in the problems under discussion.

Home Management

Support for the parents and advice to restrict permissiveness will be important. Fairly strict guidelines on daily routine without too much variation are worthwhile. Many of these children have problems with sequential memory and to offer such instructions as "go to your bedroom, pick up your clothes, make the bed and clean your teeth" will only confuse the child who cannot understand why he is in trouble after he went to his bedroom as instructed. Understanding that these omissions are not deliberate will go a long way to easing tensions in the home, just as does acceptance of minor offences without nagging response to these.

Prognosis

Many of these children will lose their minor neurological signs as they become older. School performance may improve slightly with further brain maturation. Few studies on eventual outcome are available. A follow up study of hyperactive children by Mendelsohn and Stewart (in press) revealed about one-third were thought to be normal adolescents, about one-third still showed some minor problems and one-third were a major problem with psychiatric dysfunction, behavioural disturbance involving police action or poor work records.

Some more specific problems

(a) Developmental aphasia - defined as near or total absence of spoken language, almost always in association with some problem in understanding the speech of others not explicable on the basis of hearing loss, mental retardation, psychosis, environmental abnormality or gross brain damage.
A receptive and expressive element is most usually present and sometimes minor abnormalities of hearing are noted, as well as some of the signs of minimal brain damage mentioned above.

(b) Dyslexia - a disorder with difficulty in learning to read despite adequate opportunity with cognitive disabilities often on a familial basis. Clinically, they often show impaired right-left orientation and a high degree of ambi-*non*-dexterity. There is a definite male predominance. The prognosis for reading is much worse in this group than for those with minimal brain damage. Little medical treatment is available.
Many dyslexics are referred to eye specialists to ascertain that their inability to read is not due to impairment of visual acuity. Refractive errors, retinal disorders and lesions of the optic nerve can be readily excluded. Faulty eye movement may delay reading, but does not explain dyslexia *per se*. In the condition of oculomotor apraxia, scanning eye movement is not present and reading ability is restricted to a marked degree. It has been suggested that dyslexia may be due to inability to move the eyes normally in the preferred automatic left to right direction, so making fluent reading much more difficult. Critchley states that he has been unable to substantiate this point of view.

(c) Dysgraphia and Dyscalculia - inability to attain the expected skills in writing and calculation, often associated with inability to name and indicate fingers and left-right disorientation (Gerstmann Syndrome). In the acquired form, this involves a lesion of the parietal lobes and it is suggested by Herrmann and Norrie (1958) that the neural systems controlling these skills are imperfectly developed in some children. Kinsbourne and Warrington (1963) have pointed out that many of these children also learn to read with great difficulty. He also states that management is quite empirical.

This paper has so far dealt with problems of learning in which the clinician has a small part to play in overall management. The most common condition which will come to neurological attention and which may have a great influence on school performance is epilepsy.

The child who has frank *grand mal* (major) seizures is readily recognized if a typical seizure is observed. Not so easy to recognize is the child with *petit mal* seizures or the child with temporal lobe spells.

In *petit mal*, transient "blanking out" episodes occur where the child will be observed to stare into space for a brief period and then assume normal activity. This will severely disrupt concentration and thus normal learning processes. A child with this disorder will often be accused of day-dreaming.

Diagnosis is readily made from the EEG where typical three cycle per sec spike and wave complexes may be found.

Temporal lobe abnormalities may be more bizarre and may present with behavioural disturbances, automatism, auditory hallucinations, or even temper tantrums. The EEG will again be most helpful in diagnosis.

Treatment of epilepsy is by drug therapy, once serious underlying pathology is excluded by appropriate investigations. This treatment may then be responsible for decreasing seriously a child's school performance if dosage is so high that excessive drowsiness is induced. It thus becomes necessary to

balance very carefully the influence on learning of the frequency of fits and the drug doses required.

The drugs commonly used are *Dilantin* and the barbiturates. In excess dosage, *Dilantin* will produce drowsiness and ataxia. Barbiturates may produce hyperactivity as mentioned before and thus reduce attention span, or in high dosage induce excessive drowsiness.

Special precautions may be necessary for epileptics, e.g., in swimming or gymnastics and the educator should be alerted to these.

The parent may not be alert to the presence of "spells" and an alert teacher has been responsible for the referral of children in several instances.

Summary

The physician may be able to demonstrate clinical evidence of minor brain damage in children with school problems.

While some emphasis should be placed on diagnosis to include treatable lesions, the major part of the physician will be explanation to parents and integration of supportive measures in the home and school situation.

Drug therapy may be useful in those cases where hyperactivity or emotional upset are present, with the stimulants and tranquillisers being the most helpful.

Little medical help is available in the primary developmental disorders of dyslexia, dysphasia and dyscalculia.

Epilepsy should be recognized, investigated and treated with appropriate drug therapy instituted. Treatment will need to be modified if excessive impairment of consciousness is induced by the drugs.

* * * * * *

REFERENCES

CLEMENTS, S.D. *Minimal brain dysfunction in children;* Phase one of a three-phase project. NINDB Monograph No. 3. Washington, D.C.: U.S. Government Printing Office, 1966.

CRITCHLEY, M. *Some observations upon developmental dyslexia.* In Williams, D. (Ed.) *Modern trends in neurology.* London: Butterworths, 1967.

GESELL, A. & AMATRUDA, C. *Developmental diagnosis.* New York: Paul B. Hoeber, Inc., 1941.

HERMANN, K. & NORRIE, E. Is congenital word-blindness a hereditary type of Gerstmann's Syndrome? *Psychiatria et Neurologia* (Basel), 1958, *136*, 59.

KINSBOURNE, M. & WARRINGTON, E.K. The developmental Gerstmann Syndrome. *Archives of Neurology,* 1963, *8*, 490.

ORTON, S. *Reading, writing and speech problems in children.* New York: W.W. Norton, 1937.

PAINE, R.S., WERRY, J.S. & QUAY, H.C. A study of minimal cerebral dysfunction. *Developmental Medicine and Child Neurology,* 1968, *10*, 505-520.

SCHECHTER, M.D. Developmental dyslexia. *Australian Paedriatric Journal,* 1971, *7*, 123-134.

STRAUSS, A. & LEHTINEN, L. *Psychopathology and education of the brain injured child.* New York: Grune & Stratton, 1947.

* * * * * * *

CHAPTER 3

CHILDREN WITH READING DISABILITIES

J. Elkins
(Fred and Eleanor Schonell Educational Research Centre)

Perhaps the most significant group of children with learning disabilities is that in which the predominant domain of concern is language. Within the broad category of language disabilities, difficulties in learning to read are those which occur most often. One reason for this may be that reading has assumed great importance as a medium in the learning process in modern education. Reading is also a skill which belongs to the area of formal learning, in contrast to oral communication and perceptual and motor skills, in which incidental and informal learning experiences play a much larger part.

This paper will examine research evidence relating to the diagnosis of reading disabilities, especially during the first three years of school, and make suggestions for the prevention and ameliorization of reading disabilities.

Theoretical foundations

Research in reading disabilities has been carried out for more than seventy years with relatively little reliance upon theoretical underpinning. Such pragmatic empirical research would not be open to criticism if clear directions for the prevention and treatment of reading disabilities had resulted. There has been, however, little agreement among clinicians or teachers on these vital issues, and faddism is far from unknown.

One important reason for this confused and unsatisfactory situation is that reading disabilities cannot be understood in full until the reading process has been explicated far better than at present. Work to this end has begun. Gephart (1972) outlined two approaches to improving the teaching of reading. The first calls for research on the processes of reading, language development and learning to read as a precursor to experimenting with methods of teaching children how to read. The second is "an iterative operational process involving:

> 1) objectives specification; 2) carefully monitored instruction; 3) analysis of the discrepancy between objectives and outcomes; 4) revision of instruction procedures; and 5) recycling until the outcomes-objectives discrepancy is acceptable."

There is some sense in which reading disability research is dependent upon the state of knowledge in the general field of reading itself. It is clear that much still remains to be learned about reading. Margaret Clark has suggested that it would be valuable to study not only the disabled reader, but also those children who make rapid progress in learning to read. Indeed, Clark comments that

> "present approaches to the initial teaching of reading ..... may focus mistakenly on the very features which characterize unsuccessful rather than successful reading." [1]

Some evidence will be presented in this paper in which the reading behaviour of good readers is related to other characteristics. Research and development in remedial teaching has also been conducted using the second approach. Indeed, much of the current wave of behaviourally-based prescriptive teaching belongs to this approach, while diagnostic teaching has been hampered by inadequate description of the reading process. Thus much reading diagnosis is conducted with instruments of unknown or inadequate validity, and with little clear understanding of how the correlates of reading disability are related to the reading task.

In the past five years a number of complex models of the reading process have been constructed: Crosby and Liston (1968), Geyer (1970), Goodman (1970), Hochberg (1970), Mackworth (1971), Roberts and Lunzer (1968), Venezky and Calfee (1970). This has been accompanied by the construction of models of psychological processes which may be related to reading. Some are general information processing models, others of visual pattern processing. Though it may yet be too early to build firmly upon these models, they provide a tentative frame of reference in which to interpret the results of reading research.

In a study currently being conducted by staff of the Schonell Educational Research Centre, some results have emerged which may be interpreted in relation to the idea that reading is a "constructive, language process", rather than "the precise, detailed, sequential perception of letters, words and large language units that it is commonly held to be."

A sample of 144 Grade 3 children was obtained by selecting at random 12 children from one class at each of 12 Brisbane schools. More than 35 measures were obtained, including 5 reading achievement tests. An examination of the correlations of other variables with reading indicated that the most important correlates of reading performance were tests in the auditory channel of the ITPA (especially Grammatic Closure, and Auditory Closure) and Sentence Repetition (Clay, 1972), though some other non-linguistic measures were also important (Table 1).

1. Quoted from a report in the *Times Educational Supplement*, 2.2.73, p.12.

TABLE 1

Median Correlations with 5 reading measures*

ITPA Auditory Channel		ITPA Visual Channel	
Auditory Reception	.35	Visual Reception	.16
Auditory Association	.28	Visual Association	.33
Verbal Expression	.31	Manual Expression	.09
Grammatic Closure	.46	Visual Closure	.15
Auditory Sequential Memory	.23	Visual Sequential Memory	.20
Auditory Closure	.40		
Sound Blending	.33		
ITPA total	.48	ACER Lower Grades General Ability	.50
Sentence Repetition	.42	Visual Motor Integration	.32
Eye Voice Span	.65		

* Reading tests used were St.Lucia (Cloze) Reading Comprehension Test, St.Lucia Graded Word Reading Test, Neale Oral Reading (Accuracy and Comprehension), and Schonell Reading Comprehension Test R3.

It should be noted that the general pattern of higher correlations for auditory than visual modality has been observed with other grades, though differences in importance occur. For example, in Grade 1, Sound Blending is very significant, whereas it diminishes in importance as children grow older (Elkins, 1972).

As well as evidence from correlational studies, evidence of the importance of oral language for success in reading has been obtained by comparing language development programmes and supplementary reading instruction as methods of improving reading.

A recent study by the Queensland Department of Education (1972) was designed to test the effect of a language development programme on reading achievement in Grade 5 classes at two primary schools. Results of the study were that reading improved significantly for children of average and below average reading skill, even compared with children given supplementary reading instruction. It was concluded that:

"1. Reading competence is influenced by oral language competence.

2. Remedial programs in primary school reading would be more effective if they included language activities based on the auditory aspects of primary language.

3. Conventional remediation techniques (i.e. extra reading for pupils experiencing reading difficulties) need re-appraisal." (p.iii)

T.T.S. Ingram (1970) reported on a longitudinal, prospective study of preschool children with slow speech development who were followed up after two years in school. Only 9 of 51 speech-retarded children made good progress in learning to read, while another 14 showed a slow start but improved later. In contrast, only 15% of a control group experienced difficulty. De Hirsch *et al* (1967) and Rawson (1968) also reported the importance of language retardation in specific reading difficulties.

Dyslexia or not?

Considerable controversy has surrounded terminology used in describing reading disabilities. Beyond the arguments for and against "specific" and/or "developmental" dyslexia, there exists the question of whether there are different sorts of reading problems. Some writers have suggested that although there are reading problems which are exogenous in origin, there exists "a disorder manifested by difficulty in learning to read despite conventional instruction, adequate intelligence and socio-cultural opportunity .... (and) dependent upon fundamental cognitive disabilities which are frequently of constitutional origin". [2]

Unfortunately, though such reading disability must by definition apply to only a small percentage of children, it soon became common to find estimates of 15 - 25% incidence of such specific reading disability or dyslexia. A possible explanation is that in practice such a clear-cut diagnosis is difficult to make. Careful studies by Margaret Clark (1970) and Rutter *et al* (1970) indicated that it was difficult to identify an underlying pattern within children with reading problems, and that much diversity appeared to exist.

The question to be answered is not one of terminology, but whether we should speak of *one* reading disability, or of many reading disabilities. To say that there is one reading disability may mean that one accepts a single syndrome, be it a simple one, such as Smith and Carrigan's (1959) acetylcholine-cholinesterase hypothesis, through to the conclusion of the Advisory Committee on Handicapped Children (1972), which stated

> "We take the view that, ... there is really a continuum spanning the whole range of reading abilities ... (which) includes those children whose reading backwardness is only one aspect of their general retardation." (p.3)

---

2. This definition was formulated by a Research Group of the World Federation of Neurology at a meeting in Texas, 1968.

An alternative position is to postulate that there are reasonably homogeneous subgroups within any population of disabled readers. Evidence in support of this proposition can be found in the work of Boder (1968). She isolated, clinically and subjectively, three groups of disabled readers based on patterns of reading and spelling:-

> "**GROUP I**: Children whose reading-spelling patterns reflect deficit in symbol-sound integration and in the ability to develop phonetic skills, i.e., deficit in ability to "Auditorize." (They have no gross deficit in ability to "visualize.")
>
> **GROUP II**: Children whose reading-spelling patterns reflect deficit in ability to establish visual gestalts of letters and words, i.e. deficit in ability to "visualize". (They have no gross deficit in ability to "auditorize.")
>
> **GROUP III**: Children whose reading-spelling patterns reflect gross deficit in both ability to "auditorize" and ability to "visualize." "

T.T.S. Ingram (1970, p. 437) concluded that "a number of different clinical syndromes of *specific* learning disability may be defined. Some are predominantly *visuospatial* in type, others predominantly *audiophonic*, and others a combination". However, Ingram considered that many aetiological factors could be associated with each syndrome.

Kinsbourne and Warrington (1963) claimed to have identified two groups of disabled readers, one characterized by language retardation, and the other by fundamental disabilities in sequencing.

In this paper a number of propositions will be examined:

1) that reading disability is not a single entity and subgroups of disabled readers may be isolated.
2) that even our incomplete knowledge of the reading process suggests that subgroups may exist which exhibit characteristics relating to different components of reading.
3) that since reading is a language process, language variables are likely to be involved with some "types" of reading disability.

The study of reading disability

Why has the immense amount of study devoted to reading disability produced so much contradictory evidence? An answer of great insight, but much ignored, has been given by Wiener and Cromer (1967) who suggested different models relating antecedents and consequent reading behaviour. Figure 1 shows one possible situation, in which each of several antecedents gives rise to a distinct consequential reading disability.

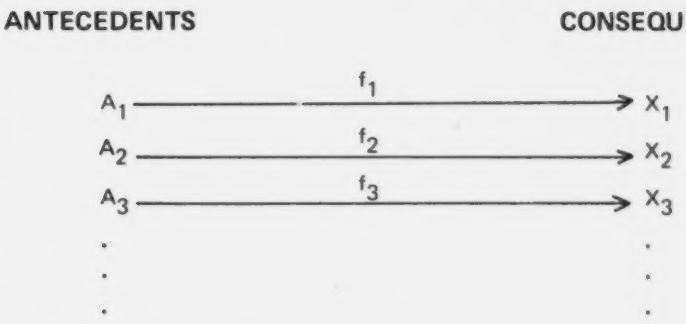

Figure 1: Model of reading disability based on Model Five (Wiener & Cromer, 1967, p.633)

The problem of conceptualizing reading disability and the group of children who are regarded as disabled readers has been clarified further by Applebee (1971). He observed that if relatively homogeneous subgroups of disabled readers exist, and are ignored, then conclusions which are drawn about distinctions between disabled and normal readers may range from meaningless to misleading. If more than two or three variables are significant in reading problems, and if subgroups of disabled readers exist, then the profile formed by averaging across the subgroups is likely not to apply to any subgroup at all, and may well be difficult to distinguish from the profile of normal readers. If measurements are used from only one domain (e.g. developmental history, cognitive test data, personality assessment), then it is likely that some subgroups of disabled readers will show a normal profile on a given set of measurements, since the predisposing factors for these groups belong to some other domain. Applebee suggested that some taxonomic procedures, similar to those used by biologists, may help impose structure upon the subject-test data matrix. The taxonomic approach differs radically from the usual study of clinical and control groups, which has been applied to the reading disability problem with minimal success.

> "A complete analysis must ideally both define the structure and also demonstrate that there are in fact basic types distinguishable within the sample, rather than merely random deviation outward from the mean profile of the group. Mathematically, this can be viewed as a search for distinct clusters of points in the test space, as opposed to a single dominant hyper-spheroid." (Applebee, 1971; p.109)

After identification of subgroups on objective and numerical, rather than logical criteria, there remains the task of describing the relationship between antecedent and consequent variables. Most important is the need to identify procedures for teaching children from each of the subgroups. Even though the delineation of aetiological syndromes is extremely important, prescriptive remedial treatment based upon parsimonious description of types of disabled readers remains the goal.

Some subgroups of disabled readers

A study was made of 56 Grade 2 children who had been referred to the Schonell Education Research Centre and diagnosed as having reading disabilities sufficient to require remedial intervention (Elkins, 1972). A procedure known as numerical taxonomy was used to identify subgroups within the total sample in an objective manner. However, the choice of taxonomic algorithm and of the measures to be included does introduce a subjective element. The twelve ITPA subtests and the composite score were used as attributes (expressed as Scaled Scores, with mean of 36 and standard deviation of 6), and a hierarchical clustering procedure based on the distance between profiles was used to classify the 56 ITPA profiles (Veldman, 1967). The clustering procedure produced four major groups (Figure 2). The mean profiles for these four groups indicated considerable differences in two different aspects, namely profile height (as indicated by the composite Scaled Score) and profile shape (Figure 3).[3]

The fundamental agglomerative algorithm requires the computation of all possible groupings of n subjects, for all numbers of groups from n - 1 to two. However, since the computation required is excessive, a procedure has been suggested in which, from n groups each containing one subject, two groups are combined to form a new group at each stage.

> "This procedure is a compromise with the theoretical ideal of optimum grouping ... , since at each stage of the process the previous grouping is accepted as the basis for determining the next reduction. One can imagine this process leading gradually to a solution which is not optimum, but only under circumstances where the 'natural' clustering ... is quite weak."
>
> (Veldman, 1967, p.309)

After performing the hierarchical clustering, it is necessary to decide which level of clustering best describes the classification. Veldman (1967) suggested that examination of the increase in within-group variance caused by each stage of clustering should indicate which number of groups provides the best description of the inter-group relationships.

The strength and the stability of the hierarchical classification was tested using an iterative multiple discriminant function (IMDF). After computation of an initial discriminant function for the groups produced by HGROUP, the distance of each subject to the centroid of each group was calculated. Each subject was then reassigned to the group to which it was closest. The analysis was repeated until no change in the assignment of subjects to groups occurred. Only one disabled reader was altered in group allocation, moving from Group B to Group A.

---

3. The supplementary subtests appear to have differing mean difficulties for Australian and American children. While a control group of Grade 2 children had mean Scaled Scores of about 36 on the ten major subtests of the ITPA, the mean performance on Auditory Closure was lower (SS = 30.5) and for Sound Blending much higher (SS = 44.5). Judgements of psycholinguistic deficits and strengths were made relative to these respective values for the supplementary subtests, instead of the American normative value of 36.

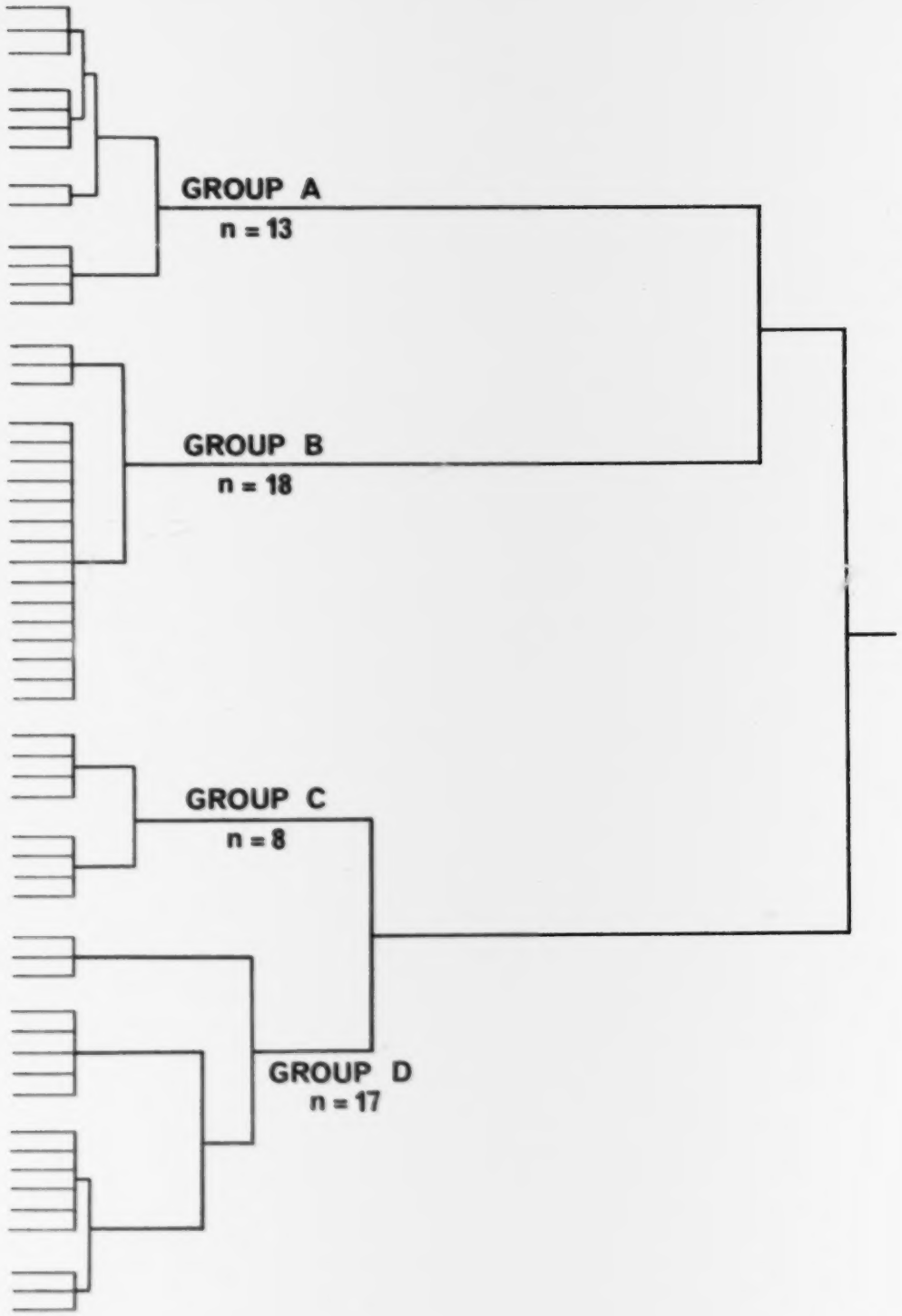

Figure 2. Dendrogram of 56 Grade II disabled readers, using HGROUP with the ITPA as attribute vector.

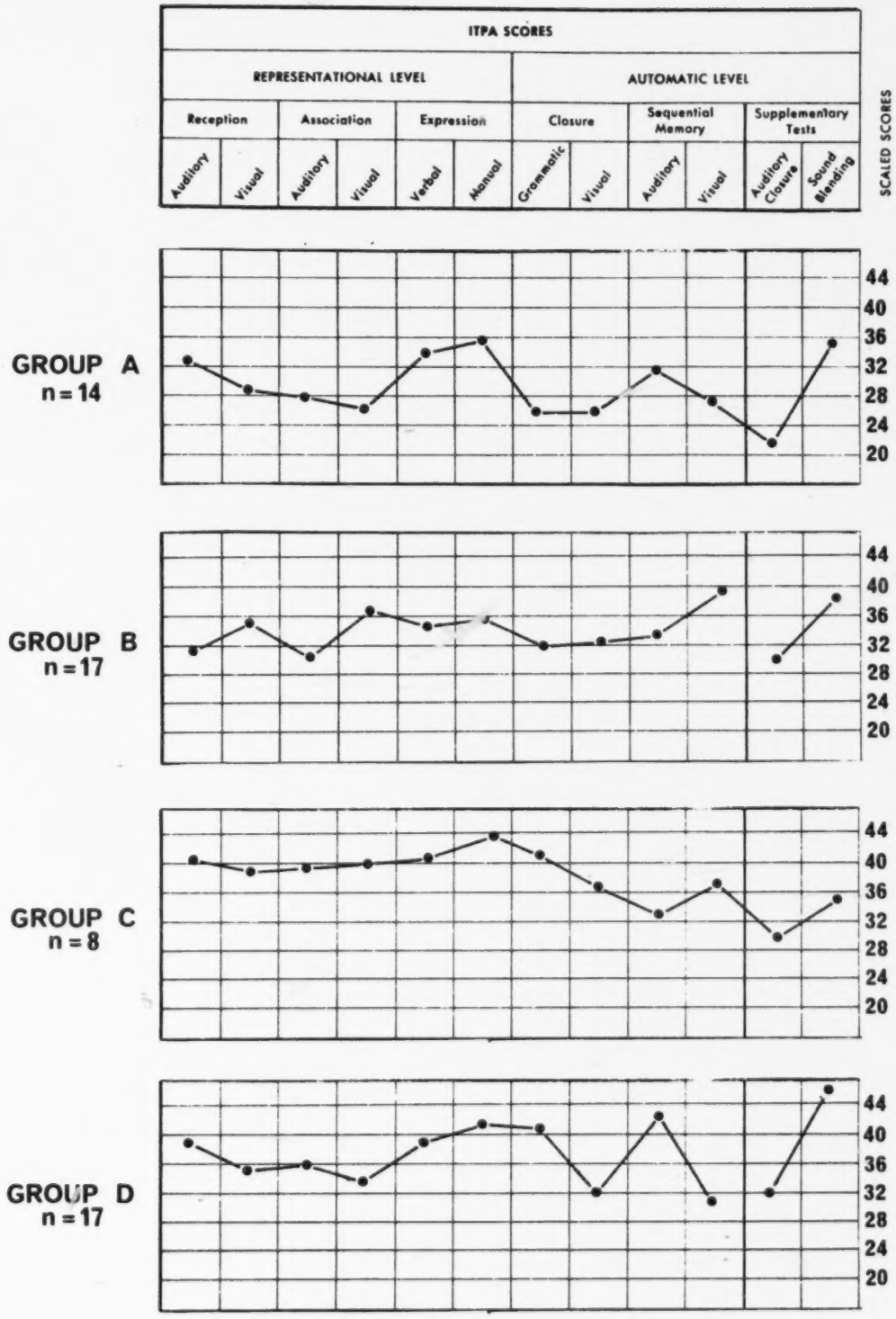

Figure 3. ITPA profiles for four sub-groups of disabled readers.

Group A consisted of 14 children, and had very low psycholinguistic ability, though their expressive skills were average. The mean profile of Group A was characterized by deficiencies in association and at the automatic level of the ITPA.

Group B consisted of 17 children with only marginal deficits in psycholinguistic skills, all subtests being within one standard deviation of the mean for normal children. Group C was small (n = 8) and of above average psycholinguistic ability. However, although Verbal Expression and Grammatic Closure were high, Auditory Channel subtests at the Automatic Level (Auditory Sequential Memory, Auditory Closure and Sound Blending) were deficient.

Group D (n = 17) was of average profile height, but differed from Group B in the shape of its mean profile. Though Auditory Channel subtests were high, a pronounced weakness was evident in Visual Closure and Visual Sequential Memory.

Characteristics of the subgroups

Since only one type of measure was used to cluster the disabled readers, other variables were examined to see whether group differences existed. Only 44 of the 56 disabled readers had been given the Frostig Developmental Test of Visual Perception (Frostig *et al* , 1964). A previous study (Elkins, 1972) had indicated that these disabled readers were not deficient on any of the five Frostig DTVP subtests. However, Group A was significantly low, and Group C was significantly high on subtest 4 (Position in Space). This result accords with the mean psycholinguistic level of the groups. It should be noted that Group C, which is of high psycholinguistic ability and is high on Position in Space has a mean profile deficit not in visual but in auditory channel skills at the automatic level.

An examination of the reading skills of the four groups was made, for 50 children for whom complete records were held. Although Groups B, C and D showed low phonic knowledge, Group A were extremely deficient, having a mean score of 24 on **P1** of the Domain Phonics Test (McLeod and Atkinson, 1972). Group A was also older than the other groups. The pattern of lower reading performance in Group A was found on word recognition and oral reading accuracy, but not on oral reading comprehension. However Group A was not greatly below the other groups on the Lower Grades General Ability Test except for subtest 2 (Picture Arrangement), on which Group A children were barely able to score at all. The peculiar difficulty of Picture Arrangement has been reported for Grade 1 disabled readers (Elkins, 1972), suggesting that it measures a logical sequencing ability which may be important in the use of semantic cues in prose reading.

It is not sufficient to seek clusters using one facet of diagnosis only. Variables used in diagnosis can be described as aetiological, correlational, or criterion-behavioural. Prevention of reading problems may be aided by identification of subgroups according to aetiological pattern. To date little success has been obtained in this, though some promising work is underway at present.

Perhaps the most necessary development will be made as we succeed in describing reading behaviour far better than at present. It may be revealing to indicate some current developments in teasing apart the complexities of the reading process.

A case study

David is a Grade 3 boy chosen as a good reader from the sample of 144 referred to earlier. His ITPA profile reveals a high psycholinguistic ability except for Visual Closure, Visual Sequential Memory and perhaps Auditory Closure. His reading performance is high, though less on Word Recognition and more on Comprehension (Fig. 4).

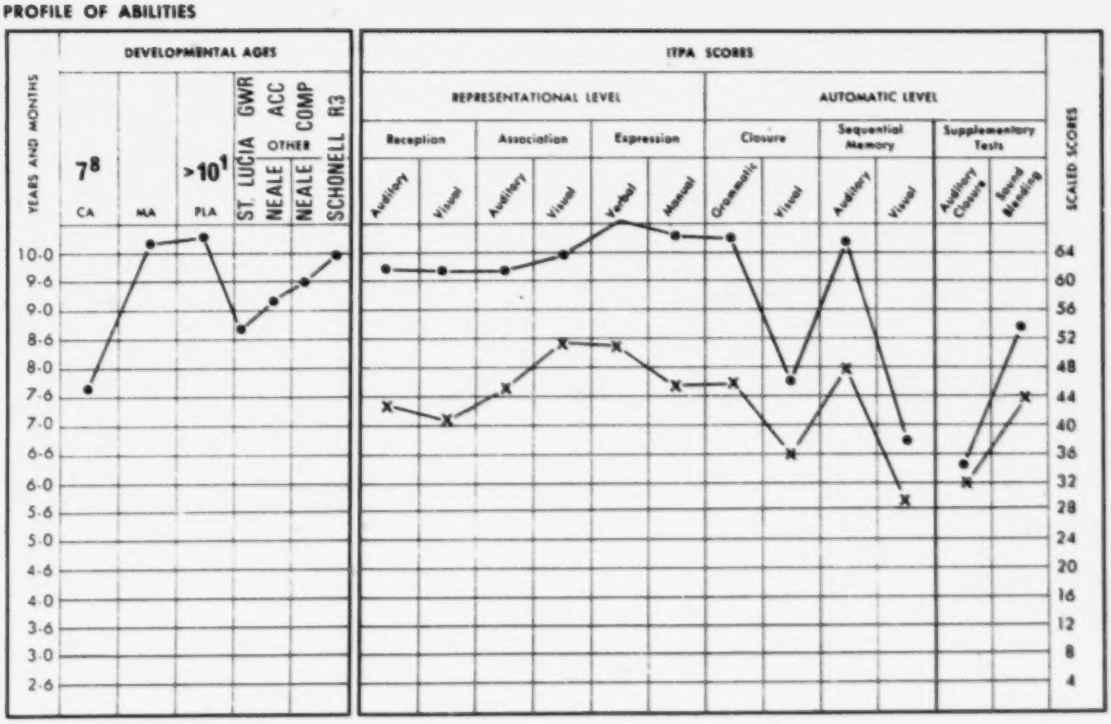

Figure 4: Case study profile - David

Goodman (1969) has developed a taxonomy of miscues in oral reading which may begin to provide the detailed analyses of reading behaviour which we have for reading correlates (e.g. ITPA). Analysis of oral reading miscues indicated that David made 16 miscues in 120 words. Three-quarters of David's errors involved repetition, with a mean rate of 2.4 attempts at each word. Contrast this with Nicholas, a boy in the same class at school, who made 48 errors but only 4 involved repeated attempts with a mean rate of 1.5 attempts at each word.

Other analyses have been made, some which promise to provide useful information are given in Table 2.

TABLE 2

Analysis of oral reading miscues for 2 Grade 3 children

		David	Nicholas
A.	Proximity (1 = low) (10 = high)		
	1. Graphic	4.9	3.5
	2. Phonetic	4.9	4.0
	3. Syntactic	7.7	5.1
	4. Semantic	2.5	2.2
B.	Acceptability (1 = low) (10 = high)		
	1. Syntactic	4	2
	2. Semantic	1.2	1.6

Implications for diagnosis and teaching

The research reported here has raised more questions than it has answered. However, by providing empirical support for the theoretical analyses of Applebee (1971) and Wiener and Cromer (1967), it has pointed the direction of future research into the diagnosis and treatment of reading disabilities. The plurality of these disabilities is certain.

It cannot be argued that the subgroups identified in the present study represent stable 'types' of disabled reader, though further studies may enable such conclusions to be drawn. Technical problems such as the choice of numerical taxonomic procedure, selection of attributes and sampling of disabled readers need further exploration. Shankweiler (1970) commented

> "there are a number of important questions about learning to read that could be answered but that usually have not been asked in research on reading and reading disability. The answers could provide the skeleton of a classification system that would permit the sorting of children who cannot read into scientifically useful categories. As long as we lack an *empirically based* [4] system of classification, no rational approach to treatment is possible." (p.482)

Yet classification should lead to order, not to labels. Even where classificatory aspects of diagnosis are clearly established, as with physically and sensorily handicapped children, the greatest educational gains are to be made by integration within the normal school. As Maynard Reynolds (1953) expressed it, let us work so that all our efforts lead "from labels to action".

* * * * * * *

4. My italics.

REFERENCES

APPLEBEE A.N. Research in reading retardation: two critical problems. *Journal of Child Psychology and Psychiatry*, 1971, *12*, 91-113.

BODER, E. Developmental dyslexia: a diagnostic screening procedure based on three characteristic patterns of reading and spelling. *Claremont Reading Conference, 32nd Yearbook*, 1968, 173-187.

CLARK, M.M. *Reading difficulties in schools*. Harmondsworth, Middlesex: Penguin, 1970.

CROSBY, R.M.N. & LISTON, R.A. *The waysiders: A new approach to reading and the dyslexic child*. New York: Delacorte Press, 1968.

DE HIRSH, K. et al. *Predicting reading failure: a preliminary study*. New York: Harper and Row, 1967.

DEPARTMENT OF EDUCATION AND SCIENCE. *Children with specific reading difficulties*. Report of the Advisory Committee on Handicapped Children, London: Her Majesty's Stationery Office, 1972.

ELKINS, J. *Some psycholinguistic aspects of the differential diagnosis of reading disability in Grades I and II*. Unpublished doctoral thesis, University of Queensland, 1972.

FROSTIG, M. et al. The Marianne Frostig developmental test of visual perception: 1963 Standardization. *Perceptual and Motor Skills*, 1964, *19*, 463-499.

GEPHART, W.J. Guest editorial: a progress report and a directional question. *Reading Research Quarterly*, 1972, *7*, no page numbers.

GEYER, J.J. Comprehensive and partial models related to the reading process. *Reading Research Quarterly*, 1972, *7*, 541-587.

GOODMAN, K.S. Analysis of oral reading miscues: applied psycholinguistics. *Reading Research Quarterly*, 1969, *5*, 9-30.

GOODMAN, K.S. Reading: A psycholinguistic guessing game. In H. Singer & R.B. Ruddell (Eds.), *Theoretical models and processes of reading*. Newark, Del.: International Reading Association, 1970.

INGRAM, T.T.S. The nature of dyslexia. In F.A. Young & D.B. Lindsley (Eds.) *Early experience and visual information processing in perceptual and reading disorders*. Washington, D.C.: National Academy of Sciences, 1970.

KINSBOURNE, M. & WARRINGTON, E.K. Developmental factors in reading and writing backwardness. *British Journal of Psychology*, 1963, *54*, 145-156.

MACKWORTH, J.F. Some models of the reading process: Learners and skilled readers. In F.B. Davis (Ed.), *The literature of research in reading, with emphasis on models*. New Brunswick, N.J.: Graduate School of Education, Rutgers University, 1971.

McLEOD, J. & ATKINSON, J. *Domain Phonic Test*. Edinburgh: Oliver and Boyd, 1972.

QUEENSLAND DEPARTMENT OF EDUCATION. *Improving reading through an oral language program*. Bulletin 39, Research and Curriculum Branch. Brisbane: Queensland Department of Education, 1972.

RAWSON, M.B. *Developmental language disability: adult accomplishments of dyslexic boys*. Baltimore, Johns Hopkins Press, 1968.

REYNOLDS, M.C. A study of the relationships between auditory characteristics and specific silent reading activities. *Journal of Educational Research*, 1953, *46*, 439-449.

ROBERTS, G.R. & LUNZER, E.A. Reading and learning to read. In E.A. Lunzer & G.F. Morris (Eds.), *Development in human learning*. New York: American Elsevier Publishing Co., 1968.

RUTTER, H., et al. (Eds.), *Education, health and behaviour*. London: Longman, 1970.

SHANKWEILER, D. Conference implications for education. In F.A. Young & D.B. Lindsley (Eds.), *Early experience and visual information processing in perceptual and reading disorders*. Washington, D.C.: National Academy of Sciences, 1970.

SMITH, D.E.P. & CARRIGAN, P.M. *The nature of reading disability*. New York: Harcourt, Brace, 1959.

VELDMAN, D.J. *Fortran programming for the behavioural sciences*. New York: Holt, Rinehart and Winston, 1967.

VENEZKY, R.L. & CALFEE, R.C. The reading model. In H. Singer & R.B. Ruddell (Eds.), *Theoretical models and processes of reading*. Newark, Delaware: International Reading Association, 1970.

WIENER, M. & CROMER, W. Reading and reading difficulty: a conceptual analysis. *Harvard Educational Review*, 1967, *37*, 620-643.

* * * * * * *

CHAPTER 4

HELPING THE ADOLESCENT WITH LEARNING PROBLEMS

Mancel R. Ellis Robinson
(Fred and Eleanor Schonell Educational Research Centre)

'Tis Education forms the common mind,
Just as the Twig is bent, the Tree's inclined.

Social and psychological implications of educational retardation

The problem of the educationally retarded adolescent is a problem for society as a whole and not merely for educators. In our literate, technologically oriented society, high priority is placed on school learning. Since our priorities determine our problems it is logical that we should be pre-occupied with the failure of so many of our young people to attain satisfactory learning skills, especially reading skills. The operant word, of course, is "satisfactory". In a simpler age it was considered satisfactory if a boy could "do his numbers", "write his name" and "read his bible stories!" Perhaps a slight exaggeration, but nonetheless it makes my point that the percentage of adolescents in the schools who have learning difficulties has increased as a function of, on the one hand, extending the number of years of schooling, and on the other, of raising the level of proficiency in literacy skills demanded of the adolescent learner. This in no way minimizes the importance of factors such as neurological impairment in the understanding of the aetiology of learning difficulties but it emphasizes the fact that educational attainment is closely related to socially ascribed standards of proficiency in positively valued skills.

We flatter ourselves that we are presenting our young with a rare prize - educational opportunities. We delude ourselves and think that we delude them into believing that we are educating them towards diversity, towards the realization of individual goals of self-actualization and personal freedom. What we are really doing is maximizing the social gains of the few at the cost of the self-esteem of the many. We are certainly not educating them towards diversity or social equality but towards conformity and social inequality.

We decry the way so many of our young people reject the values of adult society. It is so easy to dismiss it as laziness or ingratitude. What we do not recognize is that it is only a relatively small percentage of the "dropout subculture" who are the articulate, intellectualizing critics of society. For them perhaps it is true that alienation is an intellectual "freak-out", a game to be played before getting down to the boring business of earning a living. For other members of the adolescent age group alienation is reality. They may ape the attitudes, the language, the dress of their intellectually better endowed peers, because in this way they gain an identity by association. They recognize that the criticisms of the adult society of its rebellious young are tinged with a grudging respect (and even envy). Hence, the self-esteem which they cannot gain through legitimate social channels of expression is theirs through a deviation whose significance they cannot comprehend.

I am not suggesting that all adolescents with learning problems will drop out of school (at least not physically, although they may do so mentally). Those of you who are secondary school teachers will be only too well aware that many poor learners remain at school until their final year. You will also be aware of the unfortunate fact that few of them gain very much from their extended period of schooling. Even if they do not leave school early, however, they still, in many cases, share some of the characteristics of the illiterate drop-outs. Cervantes (1965) has suggested the following reasons for students dropping out of school:

1. retardation vs. nonretardation
2. satisfaction vs, dissatisfaction
3. school participation vs. non-participation
4. parental interest vs. parental noninterest
5. friends at school vs. no friends at school.

He has also related these factors to reading disability which he regards as a major determinant of early school withdrawal.

Reading difficulty has been found to be a problem for the majority of students with learning problems and to be related to social class and cultural environment (Sexton, 1961; Cohen, 1968). The relationship between dissatisfaction with school, reading disability and social background is an interesting one in the determination of academic failure. It poses many problems for educators.

Probably the most important characteristic shared by the educationally retarded adolescents who have dropped out of school with those who have stayed on is their limited occupational and economic potential. The motivational *malaise* which is experienced at school will be intensified when they find that the barriers to their attaining social status are even greater than before. In consequence, their rejection of a rejecting society may become actively destructive towards themselves and society. Many delinquents and psychiatrically deviant adolescents have experienced long-standing learning difficulties (Jorgensen, Bangsgard and Glad, 1968; Spencer, 1972).

The learning disabled adolescent is the unfortunate victim of a confused educational system, a system whose goals have lost touch with the real needs of the community. Most educators recognize this dilemma but have, as yet, been unable to find adequate solutions. This is cold comfort for the teacher who is faced with unhappy youth and who has not the techniques or the services available to help improve their situation. Broadly speaking, what is needed is a reassessment of educational goals. Instead of being preoccupied with educational attainment in terms of academic skills for all, we should be concerned with maximizing the experiences which will enable all individuals to realize a goal of social and psychological competence. Such experiences must be relevant to the life context of the individual.

The nature of competence as a societal objective has been described by Gladwin (1967) and its significance as an educational objective has been discussed in another paper by the author (Ellis Robinson, 1972). Gladwin's definition of competence has important implications for educational design:

> "Competence .... develops along three major axes, all closely interrelated. First is the ability to learn or to use a variety of alternative pathways for behavioural responses in order to reach a given goal ..... Second, the competent individual comprehends and is able to use a variety of social systems within the society, moving within these systems and utilizing the resources they offer. Third, competence depends upon effective reality testing." (1967, p.32)

Gladwin is clearly concerned with maximal attainment but education currently cannot even help many individuals to attain a minimal level. It most certainly does not develop, in the educationally retarded, what Inkeles (1966) defined competence to be, namely, "the ability to attain and perform in valued social roles" (p.280). Inkeles' criticism of social discrimination applies just as much to intellectual discrimination as it does to any other form of discrimination:

> "Lack of competence effectively to take advantage of new opportunities in a competitive system can make the attainment of nominal legal equality a hollow victory, and make a self-fulfilling prophesy of the bigots' claim that minority members are unable to perform effectively even when not formally discriminated against. To deny people the means for attaining competence while yet granting them technical equality under the law is the contemporary equivalent of saying that the majesty of the law confers on the rich as on the poor alike the right to sleep under bridges." (1966, p.280)

In order to appreciate the complexity and the magnitude of the task which faces educational innovators one must recognize the implications of an important sociological fact. Western society is experiencing a period of transition in which traditional areas of individual and social responsibility are changing. As a consequence the mechanisms within the individual which serve to ensure his psychological stability are being threatened. Unless individuals can develop more adaptive mechanisms the stability of the social system must similarly be threatened. One of the most important adaptive changes which must be made is the separation of criteria of self-valuation from criteria of occupational competence. With the declining effectiveness of the family unit as a source of constructive psychological training the educational system must accept this responsibility. This means that, in the schools, we must be less concerned with developing occupationally relevant skills, especially in the educationally retarded, and more concerned with developing socially relevant skills. These latter are the skills which will provide the individual with the flexibility to learn occupational skills and to adapt to changing skill requirements in the community. These basic socially-relevant skills include the ability to manipulate language in thought and speech and in the comprehension of oral and written communication, the ability to comprehend other symbolic systems such as numerical and temporal systems, the ability to comprehend and function within the social and political systems of one's immediate community, the ability to recognize and adapt to the needs and interests of one's fellows, the ability to maintain emotional stability and to express affect through constructive rather than destructive activities. The list is not

exhaustive but gives an indication of the orientation implied. It might be argued that the school is not the appropriate place to learn strategies of psychological development. However, I would argue that it is the only place left where these skills can be taught. The proof that they can be effectively taught in the schools has been provided by the introduction of Psychological Education into U.S. classrooms under various guises (Stanford, 1972).

Who is the adolescent with learning problems?

If the educational designer and the classroom teacher are to make adequate provision for the adolescent with learning problems they need to understand the nature of their problems. Unfortunately, children with learning problems represent diverse groups with often complex interactions of factors determining their difficulties. Some indication of the magnitude of the problem facing the educator is given by a closer inspection of the categories of adolescents who experience learning difficulties. Apelt (1972) has termed these "non-academic" adolescents and classifies them into four major groups.

> "1. Educationally retarded children of average or above average ability whose retardation may derive from:
>
> (a) socio-cultural and linguistic impoverishment associated with inadequate family background, depressed socio-economic status or cultural disadvantage;
>
> (b) specific learning disabilities (with a presumption of neurological impairment as an aetiological factor) which almost inevitably inhibit academic performance;
>
> (c) problems of emotional and social adjustment which leave little energy for the child to invest in the learning process.
>
> 2. Children at the lower-end of the average range of intelligence who may or may not be educationally retarded (that is, children who may or may not be functioning at or near expectancy level but who are all retarded relative to their more capable peers).
>
> 3. Children whose measured levels of intelligence are in the range of one to two standard deviations below the mean on an intelligence test. Classified by Heber (1962) as borderline mentally retarded, they are sometimes referred to in the literature as *slow-learners*.
>
> 4. Given the current emphasis on the integration of older opportunity school pupils into the high school environment, an increasing number of children who have been identified during primary schooling as mildly mentally retarded on the basis of low measured I.Q. associated with impaired adaptive behaviour. In the school age population, impaired adaptive behaviour expresses itself in failure to meet the instructional demands of the school." (p.18)

An alternative view of the characteristics of learning disabled adolescents is given by Kline (1972). We may argue with some of his categories, especially his "chronic dyslexics," but generally they suggest some of the factors determining non-achievement.

1. Chronic dyslexics: long-standing reading difficulties.
2. Mini-effort group: bright children who have never learned how to expend effort because learning was easy.
3. Over-indulged: bright children who have never made any efforts to learn because they have no reason to learn and cannot postpone gratification.
4. Can't lose group: children who cannot tolerate public failure.
5. Smart big brother group: younger siblings unable to measure up to older siblings' successes.
6. Afraid-to-be-curious: repressed personalities which are the product of a pathological home environment.
7. Emotionally-traumatized: the sudden onset of an emotional crisis may inhibit educational performance for a time.
8. Afraid-to-know: the child is afraid to learn because it cannot cope with knowledge.
9. Love-to-be-loved: emotionally deprived adolescents who find gratification only in the social relationships at school.
10. Psychiatrically-ill: children with severe, specific emotional illness or personality disturbance may suffer reading disabilities and other problems as a direct result of these disturbances.

Identification of learning disability in the adolescent

The fact that we can establish an arbitrary, if not mutually exclusive, classification of educationally retarded children does not necessarily bring us very much closer to solving their problem. We are still faced with the difficulty of identifying the nature of their learning problem and of developing techniques for overcoming it. The class of educationally retarded children which presents the most difficulty in terms of identification is the specific learning disabilities group. It is not unusual to find that a specific disability has not been detected at any stage in a child's schooling. Sometimes, in a child of average or above average ability, the learning difficulty has not created a recognizable problem of underattainment until they have entered 8th grade or later. If the problem is a reading disability of less than severe degree it may not be recognized until the demands placed on the child in major content areas exceed his capacity for coping with the volume and level of reading required. Unfortunately, it is at the secondary school level, where reading ability is so critical for attainment, that the least emphasis is usually placed on the development of reading skills as an integral part of the curriculum. Recognition of a reading problem in a secondary school child generally means that the child will be assigned to a special remedial reading class and/or will enter a non-academic stream. All too often the educational retardation of the child with a specific learning disability will be interpreted as below average general ability and his educational future will be planned accordingly.

The task of identifying and then helping the secondary school child with specific learning disabilities is further complicated by the lack of sensitive assessment techniques for the diagnosis of problems in this age group. While a poor level of reading may be recognized through classroom testing it

may be assumed to be related to generally poor intellectual functioning. The intelligence tests employed at this level are normally group tests which are heavily verbally loaded and require good reading skills to achieve good results. An individual test (e.g. the WISC) may detect a problem through a large discrepancy between the verbal and performance scale scores but it still cannot differentiate the areas and modalities of processing difficulty. What is clearly needed is an instrument, such as the ITPA, which can identify psycholinguistic processing difficulties for this age group. However, even if such an instrument were available its usefulness would still depend on the ability of the secondary school teacher to recognize that a specific disability might exist. Hence, there is an equally great need for developing more sensitive classroom evaluation techniques which should be integrated into the standard curriculum as diagnostic teaching techniques. For these to be maximally relevant they should be language based as well as specifically reading based.

Some educators would strongly argue against the need for developing sophisticated tests of correlates of reading ability. Cohen (1972), for example, has stated that what is needed are criterion performance assessments which will indicate precisely which reading behaviours must be learned and under what conditions and with what materials they should be taught. While acknowledging the legitimacy of Cohen's claim for precise behavioural task analysis it must be emphasized that reading is not an isolated skill. It represents one behavioural expression of an integrated language structure. Viewed in terms of an information processing system, the learner's behaviour, it may be argued, cannot be satisfactorily understood or modified without analysis of both the functional status of the system (which also implies an awareness of developmental constraints) and the specific behavioural consequences of its interaction with the environment. In other words, what I am suggesting is that an adequate assessment for the diagnosis of learning disabilities, especially in the adolescent, demands what we may term a *learner-task interaction analysis*. Remediation of disabilities for many children would then involve treatment of both the correlates of the disability and the behavioural expression of the disability. Treatment of only one *or* the other would be insufficient.

Educational provisions for educationally retarded adolescents

At the secondary school level the types of provisions which must be made for adolescents with learning problems should not involve the isolation of these children into groups with different educational goals from those of the mainstream. The needs of the learning disabled adolescent are not different from those of other children; they are merely greater.

The general needs of the educationally retarded adolescents are, as for all children, to develop a sense of belonging within the society and a sense of personal worth. For many adolescents (one would wish all) the sense of personal worth is acquired without deliberate intervention within the educational system. They readily perceive their place in society because they recognize their capacity to perform at the standard of proficiency which society demands. Too often this is not so for the educationally retarded child. His developmental retardation encompasses more than subject-matter skills. It includes a retardation of vocational maturity (Super *et al*, 1960) which has broad implications

for educational and vocational adjustment. Similarly, his perception of himself is shaped by his level of functioning compared with his peers.

The significance of self-concept for level of attainment has been generally shown (Brookover *et al*, 1964; Shaw and Alves, 1963) although some studies do not show such a relationship (Ringness, 1965). Its relationship to reading ability has, however, been more clearly indicated (Lamy, 1965; Nicholls, 1967; Fennimore, 1968; Hake, 1969; Andrews, 1971). Andrews (1971) found that poor readers showed a lack of confidence and adequacy, a tendency to conformity and dependence and strong feelings of hostility and aggression. In contrast, good readers showed confidence, striving and independence. Some reasons for these differences have already been suggested.

The significance of the concept of vocational maturity for educational planning has been made explicit by Super and his colleagues involved in the Career Pattern Study, a longitudinal research study investigating vocational development (Super *et al*, 1960). It is their contention that vocational maturity is a developmental phenomenon involving movement from "change to stabilization and from fantasy to reality" (1960, p. 7). This development is exhibited in the quality of behaviour indicative of the level or stage of occupational decision-making. Vocational development may be viewed, then, as progress from a stage of primitive, fantasy choices through a stage of tentative choices up to a stage of matured realistic choices (Ginzberg *et al*, 1951). Where there are no delays in any other areas of development such as educational, intellectual and emotional development it can be expected that vocational maturity will be equivalently well developed. In the normally functioning adolescent vocational development is approximately at the stage of tentative occupational choices (Ginzberg *et at*, 1951). The educationally retarded adolescent, however, may not have progressed beyond the fantasy stage of vocational preferences.

A discrepancy between the grade levels and the vocational maturity levels of adolescents has important implications for curriculum planning. The current educational practice is to allocate all students, on the basis of their academic attainment levels, to what must be termed a *vocationally* oriented curriculum stream at the end of eighth grade. This practice cannot be supported in view of the lag in vocational maturity which accompanies educational retardation. For the non-retarded adolescent the provision of curricula options is not only appropriate but advisable, as Super and his associates (1960) have demonstrated:

> "Vocational maturity in ninth grade boys .... is primarily orientation to the need to make educational and vocational choices, including acceptance of responsibility for choosing and planning, and a planning and information-getting approach to the orientation and choice process: it is, essentially, planfulness." (p.150).

It is important, then, that the normal adolescent be allowed to exercise his right and his readiness to choose.

The needs of the educationally retarded adolescent are different. He is not ready to make decisions, to explore vocational opportunities or to make even tentative plans. He requires a more structured curriculum which will help him to develop the more effective strategies for "reality-testing" which must be acquired before his level of vocational maturity can be advanced. The type of curriculum needed is one which will develop the kinds of socially-relevant skills discussed in the previous section.

Apart from catering for the special instructional needs of the adolescent with learning problems, then, education must also provide for his psychological and vocational adjustment needs. A strong case can be argued for the importance of a guidance programme for all secondary school children. The need for a full-time counsellor and guidance worker within the school to provide for the educationally retarded should not even require justification.

The limited occupational and economic potential of the educationally-retarded adolescent has important implications for the type of guidance programme which should be implemented for them. It was pointed out previously that rapid social change, which is the byproduct of accelerated technological advancement and increased productivity, involves a difficult adjustment for even the most gifted individuals. For the educationally handicapped it may become a problem of such magnitude that it assumes national significance. The displacement of simple skills by increased automation and computer-based systems will require that the individuals who hold these positions will either have the flexibility to adapt to new jobs quickly and frequently or to accept social welfare and exclusion from the work force. (Argyle, 1956; Winthrop, 1958a,b; Michael, 1962.) This may not be a major problem for some years yet but it is highly probable that it will be a reality when many of the present generation of school children are seeking employment.

It is our responsibility as educators to prepare them for this occupational (or non-occupational) future. One of the ways in which an educational guidance programme in the schools could cope with this problem is to shift the emphasis from self-perception of competence based on occupational skills to competence based on constructive leisure activity. If we do not attempt to shift this emphasis we will be faced with a wide-spread decline in individual self-esteem and a consequent polarization of social groups. What is needed in a high school guidance programme is nothing particularly innovative as far as other parts of the world are concerned, although it may be for Australia. There should be a substantial emphasis placed on community service projects, on the simulation of life experiences (not only work experiences such as the Life Career Game of Varenhorst (1968)) and, especially, on sample work-experiences. Unfortunately, if these activities are to be effective they must involve the co-operation of the community as a whole and this represents a difficult sales task for the educational guidance worker. It also requires a level of competence in terms of vocational guidance which few school guidance officers have had the training or the experience to achieve. Without relevant first-hand information concerning the work environment and, in particular, the kinds of work environments facing the educationally retarded, it is likely that the "credibility gap" between educator and student will increase instead of decrease.

The magnitude of the task facing us to understand and help the adolescent with learning problems cannot be minimized. Unfortunately, in this paper I have had to skim very superficially over the problem.

However, what I would like to emphasize in closing is the importance of developing a tolerance for diversity. We seem to have lost touch with human values. We need to keep in mind what Pope said, so long ago:

There's some Peculiar in each leaf and grain,
Some unmarked fibre, or some varying vein:
Shall only Man be taken in the gross?
Grant but as many sorts of Mind as Moss.

* * * * * * *

REFERENCES

ANDREWS, R.J. The self-concepts of good and poor readers. *The Slow Learning Child*, 1971, *18*, 160-167.

APELT, W. Non-academic adolescents.In J. Elkins (Ed.), *Developments in teaching children with special needs*, Fred and Eleanor Schonell Educational Research Centre, Univ. of Qld., 1972.

ARGYLE, M. Social aspects of automation. In C.M. Hugh-Jones (Ed.), *The push-button world. Automation today*. Norman, Oklahoma: University of Oklahoma Press, 1956, 109-122.

BROOKOVER, W.B., THOMAS, S. & PATERSON, A. Self-concept of ability and school achievement. *Sociology of Education*, 1964, *37*, 271-278.

CERVANTES, L.F. *The dropout: causes and cures*. Ann Arbor: University of Michigan Press, 1965.

COHEN, S.A. Socially disadvantaged Americans: slow learners. *The Slow Learning Child*, 1968, *14*, 153-160.

COHEN, S.A. Comment on Kline's paper. *Journal of Learning Disabilities*, 1972, *5*, 275-276.

ELLIS ROBINSON, M.R. An educational planning system (EPS) for the integration of guidance and instruction in the educational system. Unpublished paper, Schonell Educational Research Centre, 1972.

FENNIMORE, F. Reading and self-concept. *Journal of Reading*, 1968, *6*, 447-451, 481-483.

GINZBERG, E., GINSBURG, S.W., AXEBRAD, S. & HERMA, J.L. *Occupational choice*. New York: Columbia University Press, 1951.

GLADWIN, T. Social competence and clinical practice. *Psychiatry*, 1967, *30*, 30-43.

HAKE, J.M. Covert motivations of good and poor readers. *The Reading Teacher*, 1969, *22*, 731-738.

HEBER, R. Mental retardation: concept and classification, in E.P. Trapp and P. Himelstein (Eds.), *Readings on the exceptional child*. London: Methuen and Co., 1962. (Cited in quotation from Apelt, Winifred, *op.cit.* 1972.)

INKELES, A. Social structure and the socialization of competence. *Harvard Educational Review*, 1966, *36*, 265-283.

JORGENSEN, E., BANGSGARD, O. & GLAD, Th. Adolescent psychiatry in a private Danish institution. *Journal of Learning Disabilities*, 1968, *1*, 30-41.

KLINE,C.L. The adolescents with learning problems: how long must they wait? *Journal of Learning Disabilities*, 1972, *5*, 262-271.

LASSAY, M.M. Relationship of the self-perception of primary children to achievement in reading. In Gordon, I.R. (Ed.), *Human development: readings and research*. Chicago: Scott Foresman, 1965.

MICHAEL, D. *Cybernation: the silent conquest*, Santa Barbara, California: Center for the Study of Democratic Institutions, 1962.

NICOLLS, J.G. Anxiety, defensiveness, self-esteem and responsibility for intellectual achievement: their relations to intelligence and reading achievement test scores. *New Zealand Journal of Educational Studies*, 1967, *2*, 125-135.

RINGNESS, T.A. Emotional adjustment of academically successful and non-successful bright ninth-grade boys. *Journal of Education Research*, 1965, *59*, 88-91.

SEXTON, P.C. *Education and Income*, New York: The Viking Press, 1961.

SHAW, M.C. & ALOES, G.J. The self concepts of bright academic under-achievers - 2. *Personnel and Guidance Journal*, 1963, *42*, 401-403.

SPENCER, C.P. Selective secondary education, social class and the development of adolescent sub-cultures. *British Journal of Educational Psychology*, 1972, *42*, 1-13.

STANFORD, G. Psychological education in the classroom. *The Personnel and Guidance Journal*, 1972, *50*, 583-593.

SUPER, D.E., OVERSTREET, P.L., MORRIS, C.N., DUBIN, W. & HEYDE, M.B. *The vocational maturity of ninth-grade boys*. New York: Teachers College, Columbia University, 1960.

VARENHOROT, B. The Life Career Game: practice in decision-making. In S.S. Boocock and E.O. Child (Eds.), *Simulation games in learning*, Beverley Hills, California: Sage, 1968.

WINTHROP, H. Some psychological and economic assumptions underlying automation. Part 1, *American Journal of Economics and Sociology, 17*, 1958a, 399-412.

WINTHROP, H. Some psychological and economic assumptions underlying automation. Part 2, *American Journal of Economics and Sociology, 18*, 1958b, 69-82.

* * * * * * *

CHAPTER 5

ORGANIZATION AND IMPLEMENTATION OF INDIVIDUALIZED PROGRAMMES WITHIN THE FRAMEWORK OF A JUNIOR HIGH SCHOOL

Sister Margaret
(Seton College, Mount Gravatt)

Seton College is a co-educational junior high school. Its enrolment stands at 144 boys and girls ranging from 12+ to 16+. The ability range is from below average to above average. The above average form a very small group, no more than 10% of the whole school. 85% fall into the average band, whilst those children below average would make up roughly 5% of the total enrolment. As we are all very aware, achievement and ability do not always keep pace. I do not intend to treat of the many variables that account for this discrepancy, rather will I confine my remarks as to how we meet this problem and how we programme for students' individual differences.

Limiting of enrolments

We have a fairly satisfactory student teacher ratio. We would wish that we could do better, but finance and physical set up of the school do not allow this ideal to be put into practice as yet. The staff comprises seven full-time teachers and two part-time ones. The enrolment figure will remain constant over the next few years and it will never rise above 250. The staff will be suitably and selectively increased. The student enrolment is drawn from the normal school population range. Preference is given to children with a specific need, either economically, educationally or emotionally. Care is taken to keep the 10% of children who are above average as constant as applications allow. We feel that this upper level is desirable in order to maintain an overall balance. A representative student population gives authenticity to the social aspect of the school. Controlled numbers not only lend themselves to a high level of communication and acceptance of differences but they also facilitate planning and productive implementation of programmes at varying levels.

Psychological implications

Starting with parent-teacher and ranging through teacher-student and student-student relationships we aim at a whole hearted acceptance of the situation as it is. Everyone is encouraged to face reality. The emphasis is on a personalised approach. "I am a person, I have something to give, please accept it. I have needs, please meet them, I have some worth, please depth it. I want to succeed, please inspire and guide me." This is our starting point for organisation. It starts with people and not with things, even as early as the pre-enrolment interview.

Without an overall effort to build a self-image none of us is able to begin to set a goal or even allow others to help us do so. It is not hard to imagine what work needs to be done with children who arrive at high school not

having tasted success, and alas, who often had their failures reinforced through more successful peers or siblings, over ambitious parents, and, unfortunately, teachers who are short on understanding.

Streaming and programming

With ten years experience we see that there is a deal of value in streaming students straight into the course they intend to follow. We are of the opinion that a year is lost by making Grade 8 an elective year. This is also done because most of our students are early school leavers and they want to get going on the course they have already in mind. Should they change their options as some have done and will continue to do, they pick up the necessary subjects at sub-senior level. Before presenting for final enrolment they have an ability and achievement test at some recognised centre, usually Guidance and Special Education. Towards the end of their schooling a final test is given by Labour and National Service.

Their pre-enrolment test results have to be available prior to their enrolment interview. The parents and the child are then aware of the stream into which they will be going. Throughout the first term, necessary adjustments are made according to the student's progress or in some cases, lack of same. We do not aim to have an inflexible, homogeneous class situation. The levels in the class are dictated by the student's needs and not by the set syllabus. Some function below that level, others need broadening, while others need to build their basic foundations. We programme for individual differences that present themselves in every true learning situation. In this way we avoid blocking the individual's opportunity of success according to his or her individual ability.

We try to avoid being the incarnations of the old adage, "There is a destiny that shapes our ends. Rough hew them as we may." We do not constitute ourselves that destiny and rough hew the students as we may by pushing them into programmes in line with a syllabus, that for a particular student, may be quite unrealistic and unattainable. It is our hope that in the future we may be able to abolish the tight grade structure and have students working through the school within a given minimum or maximum time (say three to five years).

Multi-level placement

In this stream as in the normal stream, programmes are carefully written to suit the individual needs. There are 34 children in this stream. The age range is from 12+ years to 14+ years. The achievement range is from Grade 2 to Grade 8. It is a challenging situation that calls for heroic patience, even harder work and an ability to accept disappointment and to capitalise on success.

The children in this stream experience a sense of achievement, often for the first time in their school life. They taste success, their appetite for learning is sharpened or awakened and many progressions take place within the year or two years of the course. The 5% who are below average ability spend three years in this situation and leave from this stream. Others who are average, but who have a specific learning deficit, usually reading, are able to pass into the main stream at either Grade 8 or Grade 9 level. They fit into

whatever level they are able to manage in the various subjects. Some may go to *level one* in Mathematics and *level three* in English. Again there is no attempt to achieve uniformity of levels and subjects.

In the Multi-level stream, a high priority is given to spoken English. Good oral skills make for a high level of communication and this is one of the aims of the school. The individualised approach may be gauged from the fact that there would be at least 18 programmes being followed in a class of 34 children. At least two teachers work in this stream - there are three at the present time. Strong emphasis is placed on remediation of learning deficits in this stream. In fact this remediation process goes on throughout the entire school. Every group has a specific remedial period each week. Reinforcement is assured for each subject teacher realises that remedial teaching is not exclusively the task of the remedial teacher. Hence the varying levels in each subject. The whole impact of the remedial teacher, and at the moment there are two such trained teachers, would be lost if the subject teachers did not reinforce the work done by these members of staff.

Conclusion

I would hope I have not created the impression that we have all the answers to a multi-level streaming and programming situation. Our school is not another educational "Shangrila" - a place where not a cloud appears on the horizon of the instructional sky. We do, however, try to face the situation with a sense of reality. We are acutely aware of our limitations but we endeavour to cultivate realistic attitudes in students which is a good starting point for helping them towards self-motivation. We strive to use every opportunity to create a situation wherein students can learn how to learn. After all isn't this one of the identifying marks of true education. As Karl Rogers said, "The only man who is truly educated is the man who has learned how to learn," and again "Knowledge gives a basis for security." Hence we strive to give the students a situation in which they can use their levels of ability in learning how to learn more.

This is not an easy task. It is one that calls for hard work and a spirit of enthusiasm and dedication. But it is an extremely satisfying and rewarding experience.

* * * * * *

CHAPTER 6

AUDITORY IMMATURITY AS AN EDUCATIONAL HANDICAP

A.N. Lewis
(Department of Speech Therapy)

Several years ago, Rosen (1967) reproached audiologists for their reluctance to trespass across the boundaries of their discipline into the rich, new pastures of special education. More recently, Katz and Illmer (1972) framed an attractive invitation seeking audiological assistance in the diagnosis and remediation of children with special learning disabilities. Despite assurances that their expertise is pertinent, audiologists in Australia have been slow to capitalise upon the opportunities for involvement in this important specialty. Their tardiness is historical rather than intentional.

In Australia, the science of audiology has grown up under medical tutelage. Its specific assignment has been to detect deafness and to compensate hearing impairment by appropriate fitting of hearing aids on those individuals who cannot be helped by surgical or medical intervention. For many years, in fact, the main repository of audiological knowledge and skill has been the Commonwealth Acoustic Laboratories, whose policies and interests are strictly curtailed by parliamentary enactment and by the "wing-clipping" proclivities of the Commonwealth Treasury. The Laboratories authorisation does not extend into educational matters, traditionally identified as prerogatives of the States. But even the recent proliferation of audiological clinics in public hospitals has failed generally to give the science a broader expression. These, too, have been medically inspired and medically administered.

Perhaps the failure of audiology to shed the constraints of its history is best explained by the meagreness of its inter-disciplinary contacts. After twenty-five years as a recognised profession in this country, audiology has achieved academic standing only in one Australian University - the University of Queensland. I mention this somewhat ruefully, yet to assure you that, as educationalists, you should entertain neither the hope nor the fear that audiology in Australia will move swiftly to stake out territorial claims on your preserves.

Any encroachment that is intended will almost certainly be in the area of diagnosis. Few Australian audiologists possess background and training to cope with the rigors of classroom teaching or even protracted individual therapy. Perhaps audiology can best serve the child with learning difficulties by relinquishing some of its clinical attitudes to other disciplines more directly concerned with remediation. The inclusion of audiology in the Queensland Speech Therapy course is a step in this direction, but I can see no good reason why relevant aspects of audiology should not be taught to students of special education. Such an arrangement would have the obvious merit of welding medical-type diagnosis to educational-type diagnosis. Diagnostic dissection of the child often neglects the problems of re-synthesis, a compelling argument for keeping both identification and remediation in the same hands.

Despite the implied disadvantages of diagnosis in a vacuum, I must admit that my own immediate interest in the child with special learning disabilities is entirely diagnostic and almost exclusively concerned with Australian Aboriginal children. Many of these, I believe, fit accepted descriptions of this educational syndrome. Myklebust (1964) applied the term, psycho-neurological learning disorder, to children " ..... who have good learning ability but who make little progress academically." Elaborating on this, he stated that, "It is apparent that many of these children are not mentally deficient or primarily emotionally disturbed. Rather, they have sustained through disease, trauma or heredity a minimal disorder in the brain which markedly affects a specific type of learning."

Some prominent educationalists would take issue with the inference of brain disorder, preferring a non-committal label such as "brain different" to describe the behavioural incongruities of these children. I shall not be drawn into this debate. Terminology is largely a matter of individual preference or orientation. The only thing that seems to count is that many children, including a large number of Aboriginal children, fail to thrive on a standard educational diet. The reasons for this will be diverse as, indeed, will be the remedial prescriptions.

One important area in which Aboriginal children seem to be at risk is the area of nutrition. Birch and Gussow (1970) reviewed an extensive literature that implicated early malnutrition as a causative factor in retarded brain growth and intellectual deficit. Much of their evidence was drawn from animal experiments, although the few human studies in the series did nothing to dispel the fear that any biological organism nutritionally deprived during periods of rapid brain growth will suffer developmental abberations. Gross estimates of brain size obtained through anthropometric measurement of head circumference support the impression that critical period malnutrition is prevalent in Aboriginal children (Stuart et al 1972). Jose and Welsh (1970) have shown, moreover, that over 50% of Aboriginal children in Queensland in the age range of six months to three years suffer some form of growth retardation. Presumably, this is a consequence of protein-calorie malnutrition and malabsorption, either through episodes of gastric disorder or through parasite infestation. These authors also report a strong relationship between growth retardation and school performance, although we should not be too ready to accept a one to one relationship. Poor nutritional status is only one of the many *parameters of disadvantage* that might contribute to the Aboriginal child's educational handicap. Birch and Gussow (1970) seemed close to the truth when they concluded that, "In children, malnutrition probably does not act alone to interfere with learning but acts in concert with a number of social, cultural and medical accomplices. We should be careful to recognise, however, that shared complicity does not imply innocence. It implies rather that the victim has been multiply assailed and needs multi-directional defences."

In general terms, we must agree that fine scholars rarely spring from unfine backgrounds, but this, in itself, would hardly sustain the argument that the learning impoverishments of Aboriginal children can be understood within the framework of special learning disabilities. We will need to call in further witnesses.

Studies of the psycho-linguistic abilities of Aboriginal children disclose significant deficits in the auditory-vocal channels of communication. Using the Illinois Test of Psycholinguistic Abilities, ITPA, Teasdale and Katz (1968) found that Aboriginal children in New South Wales gave inadequate performances on all auditory sub-tests, but matched control group subjects on most visual tests. On the basis of this data, they argued that auditory inefficiency was concomitant with low socio-economic status, possibly reflecting the limited linguistic models of the disadvantages child's communication environment. Similar ITPA profiles have been recorded in Queensland by the Van Leer Foundation Project. This group also implicated linguistic models, the use of non-standard English, as the culprit although they did comment that many of the children in their samples suffered educationally significant hearing impairments.

It is interesting to note that Holm and Kunze (1969) obtained the same auditorally, damaged ITPA profiles from a group of children suffering chronic middle ear disease. Inadequate or inappropriate language stimulation was controlled out of this study. It might well be that a child's language development can be threatened alike by impoverished delivery that he hears very well or rich linguistic utterance that he hears very poorly. If this is the case, the Aboriginal child is uniquely at risk for his language development must survive both kinds of insult. To the burden of faulty input is added the burden of imperfect understanding.

Aboriginal children in Queensland suffer an unusually high incidence of middle ear disease and associated hearing impairment. Survey type studies at various settlements have returned the following results for school populations (Table 1).

TABLE 1

Crude Incidence Percentages Of Children
With Significant Hearing Impairment

Community	Incidence
Edward River (1970)	8%
Cherbourg (1970)	41%
Palm Island (1971)	34%
Yarrabah (1971)	58%
Cherbourg (1972)	27%
Woorabinda (1972)	50%

The peak incidence of disease seems to occur among pre-school children and there is evidence on some settlements that over 60% are sentenced to a "stretch" of auditory deprivation from the age of six months onwards.

Until recently, audiologists paid scant attention to the educational consequences of middle ear deafness. It does not have the grave effects on speech and language development that accompany sensori-neural lesions and we had assumed that, since middle ear deafness usually follows an episodic course, the child's language development would catch up during periods of remission. We now suspect that such optimism is without foundation. It seems that the listening strategies and perceptual defences developed in times of famine will persist through times of plenty. A child affected with middle ear deafness during critical periods of language development is forced to cope with an inconsistent auditory world which might vary from week to week or even from day to day. That his communication involvement should be attended by uncertainty, inefficiency and drifting concentration is surely no cause for surprise.

Recent research has established that many consequences of sensorineural deafness occur in a lesser degree in children with middle ear impairments. Katz (1965) reported substantial tone decay in cases of chronic otitis media. This phenomenon, previously thought to accompany only neural lesions expresses itself as an inability to sustain perception of continuous sounds. At onset, the sound is heard at a normal loudness level, but within seconds it begins to fade. In the past, this has been associated with hearing disorders that provoke considerable speech discrimination difficulties.

Roberts, Simon and Thomas (1972) examined the auditory-vocal reaction times of children with middle ear pathologies. They found a reciprocal relationship between stimulus intensity and speed of perception. Intense sounds were perceived rapidly; soft sounds suffered perceptual delays. Their conclusions are both interesting and provocative.

"The interpretation of simple spoken phrases imposes on the individual the need to attend to a complex of many tones which swing over a 30 db range from the quietest phonemic units to the loudest. If, as the findings of this study suggest, a reciprocal relationship exists between the intensity of sound and its speed of perception, it is possible that a child with a moderate degree of conductive hearing loss in whom most of the quietest speech sounds heard will be barely louder than his auditory threshold, could perceive the loudest phonetic units of speech before the quieter ones - even though they were spoken in reverse order - thereby suffering auditory-temporal inversion, possibly analagous to the visuo-spatial inversions experienced by a child with a specific reading disability."

The effect could be doubly confounding for the conductively deafened child since the louder elements of speech might exert a masking influence on the softer units, thereby depriving the child of consonant sounds that carry the bulk of intelligibility. To add further substance to this claim, Forcucci and Stark (1972) demonstrated that, "children exhibiting possible fluctuating hearing losses tend to have a greater incidence of speech-language deficiencies than is normally expected."

Whether or not it is accompanied by significant loss of hearing sensitivity, a middle ear lesion must be presumed to act as a source of distortion on the incoming speech signal. Adult listeners tolerate much distortion, easily deriving meaning from the fragments of information that

survive the distortion process. The mature brain is rich in neurological interconnections and is able to exploit a multiplicity of non-auditory cues that accompany speech. It extracts significance also from subtle contextual factors that presuppose intimate familiarity with the language. These safeguards are not available to the immature brain, beleagured as it is with degraded speech patterns at the very time the child is setting down the neurological substrates of verbal communication.

Audiologists have not fully explored the extent to which a child's speech and language development will suffer as a result of middle ear impairment. Preoccupation with the gross educational effects of sensori-neural deafness has given us a research stance that is somewhat insensitive to subtle abberations in auditory perception. The hearing deficits of severely deaf children can be assessed in simple terms using pure tone signals and word discrimination tests. The primary defect is evident at the level of reception and all higher processing skills will suffer in consequence. It is inevitable that the severely deaf child will be deficient in auditory memory and will fail to make use of the whole array of auditory functions that depend on stereophony. The maturation of these skills will be delayed or even obliterated unless the individual is exposed from birth to a rich acoustical environment and has the sensory apparatus to profit from this experience. Auditory immaturity stemming from inadequate auditory stimulation is so predictable in the severely deaf child that we have little occasion to test for it.

Auditory immaturity may be found, however, in children who are not deaf in the accepted sense of the word. Pure tone sensitivity tests and simple word discrimination tasks might disclose no abnormality and yet the child is auditorally impaired. His problem will manifest itself as a learning disorder involving specific aspects of the language process with consequent spillage into cognitive and conceptual areas of behaviour. As Myklebust (1964) explained, "We must infer that when auditory language is lacking or seriously impeded, read and written language are restricted on a reciprocal basis."

In similar vein, Hardy (1967) supported the view that, "The sensory systems are closely interlinked and that breakdowns in the management of intersensory information and the translation into motor output systems constitute a major problem in children with central nervous system dysfunctions. These integrative dysfunctions seem to underly the more common language disorders." Auditory immaturity is one of the most common findings in children with reading disabilities (Tarnopol, 1969).

It is not always a simple matter to demonstrate that a child's auditory processing skills are immature or inefficient. Quite often the inadequacies are exceedingly subtle and might well pass unnoticed were it not for the stringent demands that present day educational expectancies impose on the neurological integrity of the child.

In approaching the problem of diagnosis in this complex area, audiologists have concentrated on a number of auditory functions thought to be prerequisite to normal language development. An extensive literature on language disturbances in temporal lobe lesions in the brain suggests, for instance, that language functions are represented primarily in the left cerebral

hemisphere more or less independently of other functional asymmetries such as handedness, eyedness and footedness. It appears that either hemisphere may subserve the interests of language but that the majority of children develop a laterality effect, giving a perceptual advantage to the left hemisphere, regardless of whether the child is right or left handed. According to Nagafuchi (1970) and Kimura (1963), this effect is evident by the age of three or four years, a little earlier in girls than in boys. It is a furtive event that is recognisable only when the two hemispheres are thrown into competition for the perception of simultaneously presented speech material. Broadbent (1954) devised a test in which he delivered synchronised pairs of digits to the left and right ears of his subjects. After three such pairs had been presented, he asked the subjects to report what they had heard. Instead of reporting back in pairs (i.e., 46; 23; 95), most subjects reported all they had heard in one ear, usually the right, before attempting to report anything from the other side (i.e., 429; 635). Subsequent studies have shown that most people have a significant right ear superiority for dichotic digit recall and this suggests a left cerebral dominance.

Somers and Taylor (1972) presented a modified Broadbent test to a group of children with histories of speech and language delay. The expected right ear superiority was not forthcoming, suggesting qualitative differences in cerebral speech processing. Bryden (1970) obtained similar evidence of unstabilized laterality in a group of children with reading difficulties. Ling (1971) worked with partially deaf children and again concluded that ear-asymmetry had failed to develop in the majority of her subjects.

Far more pertinent to the present discussion is the evidence of Kimura (1967) and Geffner and Hochberg (1971) that ear preference develops later in children from low socio-economic backgrounds. Kimura accepts this as a sign of auditory immaturity and relates it to the poor scholastic achievements of disadvantaged children. While advocating a need for cautious interpretation of their findings, Geffner and Hochberg imply a possible link between malnutrition and delayed cerebral dominance for language functions. Few people would dispute the merits of caution in any field of scientific enquiry, but the consistency of atypical results in children with learning difficulties and in children of low socio-economic status favours the conclusion that both groups are performing at a rudimentary level of language development.

Connors, Kramer and Guerra (1969) tested low achieving children on dichotic listening tasks and also on auditory synthesis skills. According to these authors, auditory synthesis or sound blending "requires the abilities to discriminate the component phonemes, to hold the elements in memory for a brief time and to achieve an integrated pattern with semantic and syntactic significance". Not only did the children tested show deficiencies in blending, but they had generally failed to establish ear preferences in the dichotic task. This does not imply that the two skills are functionally related, but suggests, rather, that each is a measurable aspect of the sophisticated auditory processing that is necessary for normal language development.

Perhaps the most important auditory skill for educational purposes is the ability to separate the sound environment into figure and ground components; an act of selective attention. Word comprehension against a competing background

of noise apparently requires the participation of both ears and the use of fine time differences in the arrival of sound images at the cortex. Binaural incoordination at any level, peripheral or central, might place the individual at considerable disadvantage if he has to listen under less than perfect acoustical conditions.

Katz (1972) has reported that 60% of children with learning disabilities have auditory figure-ground confusions. Many of these children, in consequence, will be functioning as deaf children in a classroom situation that permits a high noise level.

Poor performances on speech-in-noise tests have also been recorded for socially disadvantaged children. Goldman and Sanders (1969) hypothesise that noise levels in underprivileged homes are characteristically high, but that speakers raise their voices to over-ride the background sounds, depriving the children of any opportunity to practice listening under unfavourable signal to noise ratios.

I suspect that the problem is infinitely more complex than this; that the socially disadvantaged child, in fact, is burdened with many inequalities minor in themselves perhaps, yet collectively disastrous to school achievement. The persistent trends in the data on auditory immaturity would favour the view that the educational dilemna of the poor child approximates the handicap of the child with minimal cerebral dysfunction. There is no need to postulate identical lesions, although these might exist in individual cases. The comparison holds good only at the level of performance, suggesting a common mechanism that demolishes the child's contact with his environment in the classroom or even in the home.

In audiological terms, I see this as the effect of multiple distortions. The multiple distortion hypothesis was most explicitly formulated through the work of Harris (1960) who investigated the influence of various distortions on the intelligibility of connected discourse. He introduced distortion by having his speakers eat a sandwich while talking, by accelerating their rate of utterance and by talking with a peg on their noses. Further sources of distortion were contrived by controlled reverberations and periodic stimulus interruption. He was at pains to simulate real life situations.

Such is the intrinsic redundancy of connected speech that any one of these distortions will deplete intelligibility only by ten percent. But if two distortions are combined (e.g., unfavourable reverberations and accelerated utterance) the total effect is greater than the sum of the parts; the listener now suffers an intelligibility decrement of about fifty percent. The addition of a third distortion will depress the score to twenty percent and fourth might obliterate intelligibility altogether.

Let us translate these observations to the listening conditions of the average Aboriginal child attending a primary school. He brings to the classroom a built-in distortion; his middle ear disorder. Then he encounters noise-masking and possibly poor room acoustics. His teacher's voice is always crystal clear, but it belongs to a different culture. The inflections are different as also is the rate of utterance. Much of the vocabulary is unfamiliar. The

physical constraints of the classroom and the need for orderly behaviour deprive him of many non-auditory cues to communication; facial animation, movement, gesture emotion, and he is thrown back onto his auditory resources, the very areas in which he is least capable. But add to this the probability that he is sick, that his nose is running, that his stomach contains more parasites than food. Then add the gnawing persuasion that the subject matter of his curriculum is alien to the needs and expectancies of his culture. Add the unremitting spectre of past defeats. Combine all these in the one child and you really have a scholar on your hands.

It would be possible to conceptualise similar distortion matrices for all socially disadvantaged children and, indeed, for all children with specific learning disabilities. The elements would vary but the end results would be much the same, leading, in each case, to an inability to draw sustenance from the learning environment of a normal classroom.

Perhaps it is expected that having convicted auditory immaturity as a major source of educational incompetence, I should now pontificate on remedial or conservational strategies available to the classroom teacher. I hesitate to do this, never having faced a group of children with a stick of chalk in my hand and being well separated in time from my own traumatic experiences of classroom learning, but there do appear to be some general principles, the practicality of which I will leave you to decide.

1. There seems to be a need to conduct a substantial part of the child's education under acoustically controlled conditions. This might be accomplished by reverberation treatment of classrooms and by effective isolation of classrooms from noisy areas in the school.

2. To ensure that the child with special learning disabilities is not drawn to irrelevant stimuli, class size should be kept to a minimum. Effective use might be made of auditory training devices used in deaf schools, especially those that incorporate loop induction systems that give the child personal control over stimulus intensity.

3. The opportunity to exploit non-auditory cues to understanding requires a "laissez faire", classroom atmosphere that almost certainly conflicts with the need for silence. Some part of the child's activities should be spent in unrestricted communicational interaction and some in contrived situational play.

4. At a more specific level, auditorally immature children would profit, I imagine, from methods of instruction that gave multiple representations of stimulus material. This not only implies the use of inter-sensory presentations, but multiple cueing within a given modality. In language stimulation, for example, one should say:

   This is a <u>ball</u>.
   It is a big <u>ball</u>.
   This big red <u>ball</u> is round.
   Roll the <u>ball</u>.
   Bounce the <u>ball</u> on the floor.
   Throw the <u>ball</u> to Harry.
   Put the <u>ball</u> down now.

This is an application of the carnival philosophy that what you lose on the swings you might recoup on the roundabouts.

5. Auditory discrimination training and phonemic synthesis training have been shown to produce significant gains in diverse areas of language development. This form of intervention is likely to do the most good if given in a programmed learning situation in which goals and rewards are never too distant.

6. The literature abounds with exhortations to set a slow pace, to reiterate, to reinforce, to enrich experience, to limit distractions, to motivate, to resist all tendencies to pass judgement, to work to the strengths, to involve parents and a host of other wisdoms and insights that educationalists list as the ingredients of successful teaching. I have no comment other than the vague suspicion that too many prescriptions might be as bad for the patient as too few.

7. Medical conditions such as ear disease should receive energetic treatment without delay.

In short, give this child an educational environment that is more like a clinic than a school. Remove him from the scene of his failure. Treat him not as a pupil, but as a patient, according him the full range of benefits that should be available through any registered educational practitioner.

* * * * * *

REFERENCES

BIRCH, H.G. & GUSSOW, J.D. *Disadvantaged children :health, nutrition and school failure*. New York: Grune and Stratton, 1970.

BROADBENT, D.E. The role of auditory localization in attention and memory span. *Journal of Experimental Psychology*, 1954, *47*, 191-196.

BRYDEN, M.P. Laterality effects in dichotic listening. Relations with handedness and reading ability in children. *Neuropsychologia*, 1970, *8*, 443-450.

CONNERS, C.K., KRAMER, K. & GUERRA, F. Auditory synthesis and dichotic listening in children with learning disabilities. *Journal of special Education*. 1969, *3*, 163-169.

FORCUCCI, R.A. & STARK, E.W. Hearing loss, speech language and cystic fibrosis. *Archives of Otolaryngology*, 1972, *96*, 361-364.

GEFFNER, D.S. & HOCHBERG, I. Ear laterality performance of children from low and middle socio-economic levels on a verbal dichotic listening task. *Cortex*, 1971, *7*, 193-203.

GOLDMAN, R. & SANDERS, J.W. Cultural factors and hearing. *Exceptional Children*, 1969, *35*, 486-489.

HARDY, M.P. The evaluation of communication skills. Proceedings of 1967 International Conference on Children and Young Adults with Learning Disabilities, 1967.

HARRIS, J.D. Combinations of distortion in speech. *Archives of Otolaryngology*, 1960, *72*, 227-232.

HOLM, V.A. & KUNZE, L.H. Effect of chronic otitis media and language and speech development. *Pediatrics*, 1969, *43*, 833-839.

JOSE, P.G. & WELSH, J.S. Growth retardation, anaemia and infection with malabsorption and infestation in the bowel. The syndrome of protein-calorie malnutrition in Australian Aboriginal childre. *Medical Journal of Australia*, 1970, *1*, 349-355.

KATZ, J. Temporary threshold shift, auditory sensory deprivations and conductive hearing loss. *Journal of the Acoustical Society of America*, 1965, *37*, 923-924.

KATZ, J. & ILLMER, R. Auditory perception in children with learning disabilities. In Katz, J. (Ed.) *Handbook of Clinical Audiology*. Baltimore: The Williams and Wilkins Co., 1972.

KIMURA, D. Speech lateralization in young children as determined by an auditory test. *Journal of Comparative and Physiological Psychology*, 1963, *56*, 899-902.

KIMURA, D. Fundational asymmetry of the brain in dichotic listening. *Cortex*, 1967, *3*, 163-178.

LING, A.H. Dichotic listening in hearing-impaired children. *Journal Speech and Hearing Research*, 1971, *14*, 776-792.

MYKLEBUST, H.R. *The psychology of deafness*. New York: Grune & Stratton, 1964.

NAGAFUCHI, M. Development of dichotic and monaural hearing abilities in young children. *Acta Otolaryngologica*, 1970, *69*, 409-415.

ROBERTS, C.F., SIMON, A. & THOMAS, G. A study of audiovocal reaction time responses in school children with conductive hearing loss. *Audiology*, 1972, *11*, 194-198.

ROSEN, J. Distortions in the training of audiologists. *Journal of the American Speech and Hearing Association*, 1967, *9*, 171-174.

SOMERS, R.K. & TAYLOR, M.L. Cerebral speech dominance in language disordered and normal children. *Cortex*, 1972, *8*, 224-231.

STUART, J.E., QUAYLE, C.J., LEWIS, A.N. & HARPER, J. Health, hearing and ear disease in Aboriginal school children. *Medical Journal of Australia*, 1972, *1*, 855-859.

TARNOPOL, L. *Learning disabilities. Introduction to educational and medical management*. Springfield, Illinois: Charles C. Thomas, 1969.

TEASDALE, G.R. & KATZ, F.M. Psycholinguistic abilities of children from different ethnic and socio-economic backgrounds. *Australian Journal of Psychology*, 1968, *20*, 155-159.

VAN LEER PROJECT. Research report on some effects of an experimental language development programme on the performance of Aboriginal children in their first year at school. Department of Education, Queensland, 1972.

* * * * * *

CHAPTER 7

PRESCRIPTIVE TEACHING OF CHILDREN WITH LEARNING DISABILITIES

Joan K. Atkinson and V. Patricia Gunn
(Fred and Eleanor Schonell Educational Research Centre)

In the early 1960's special educators became dissatisfied with the usefulness of etiologically oriented diagnosis and switched their attentions away from the concepts of causation and classification. Special psycho-educational diagnostic tests such as the ITPA and the Frostig Developmental Test of Visual Perception were developed in an attempt to bridge the gap between diagnosis and remediation. Diagnosis now became concerned with the processes within the child and the emphasis was on basic perceptual, integrative and expressive functions. Intra- as well as inter- individual variability was stressed and prescriptive teaching programmes were developed to remedy deficits seen as detrimental to learning. These prescriptive teaching programmes corresponded point for point with the diagnostic hypotheses generated from the test results.

Unfortunately, the emphasis on the correlates underlying the learning problem in this diagnostic-remedial approach was sometimes narrowly interpreted as being all that was required for the remediation of educational problems and consideration of educational tasks and their components was neglected.

Consequently, Mann and others expressed increasing concern about current remedial practice. To quote Mann (1970) "professional fascination with perceptual approaches has meant a neglect of the multitude of physical education, penmanship and drawing techniques that could have accomplished much the same or even better results and would have been far more relevant to the child's school and other life pursuits. Digression from the relevant may be the most glaring indictment to be made of the differential training approaches." Cohen (1971) with much the same viewpoint has made an even stronger statement: "I would play the visual perception game if I were in the visual perception business." He concluded by saying that "in the reading field .... teach letters and words." Of course there are cases where perceptual training is relevant to the child's whole life activities and even Cohen admits that such training may be necessary "in rare cases" to get the child "behind a desk and on to paper."

Another educationist who believes that not enough emphasis has been placed on relevant academic requirements is Peter (1972) who has described an alternative form of prescriptive teaching which is based on the child's present behaviours and on specific educational requirements. According to Peter

> "if the present interaction with the environment is unsatisfactory the only effective intervention the teacher can make is to manipulate some events here and now. There is no way the teacher can prevent or reverse past events and it is not in his area of competency or responsibility to correct biological or organic defects. Regardless of the nature of past events, the child is interacting with the current environment."

This kind of viewpoint depends to a large extent on behaviourist concepts of how to modify performance in order to allow the child to operate adequately in his present environment. It represents a change in focus - away from processes assumed within the child, to present behaviours and manipulation of current events.

What is the task analysis approach?

The new emphasis is on specifying observable, educational objectives and identifying the specific tasks the child needs to be taught to realize these objectives. A related emphasis is on the analysis of tasks to be taught into sequential component sub-steps, to ensure mastery of the objectives. After objectives have been established, procedures, content and method relevant to the achievement of desired outcomes are selected.

The answer to the question "*What* does the child need to be taught?" may be derived both from classroom observation and from performance on tests designed to measure skill mastery.

The answer to the question "*Why* should the tasks be broken down into smaller sub-steps?" might best be answered by looking at how a child learns say, a motor skill like learning to ride a bicycle. Some children with an aptitude for all three skills of steering, balancing and pedalling may be able to jump on the bike and ride away almost at their first attempts. Others may find the steps of steering and pedalling relatively easy but may have to spend some weeks perfecting their balance.

The same kind of assumption can well be applied to academic programmes whether they be concerned with advanced physics, elementary mathematics or reading. Some pupils will proceed with such ease through all the components of the task, that the sub-steps may scarcely be discernible. But others, with difficulties, will need to be given the opportunity to master a little at a time if they are to achieve complete mastery of the skill (Figure 1).

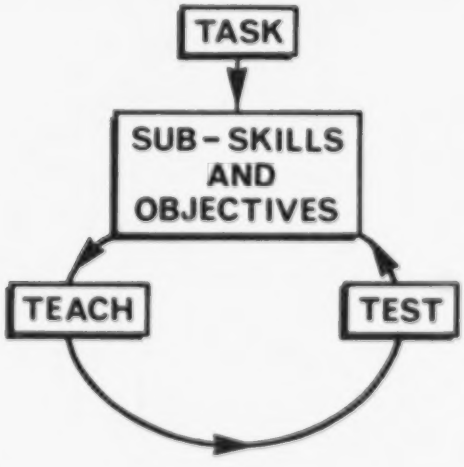

Figure 1. Task Analysis

When this task analysis approach is applied to an academic programme, the first requirement is a clear statement of specific objectives. These objectives must be stated so precisely that accomplishment can be readily determined. For example, they would not be phrased in such terms as "Improve spelling" but may take the form "The child will correctly spell twenty words from the Dolch list which the teacher dictates to him."

Objectives always describe what the learner will **do** to demonstrate achievement. A statement of objectives uses words like "list," "name," "draw," "point" in contrast to less specific verbs like "appreciate," "know" and "understand."

When objectives are set down the next step is to determine the level of the pupil's mastery, and the prescriptive teaching which follows will be geared to the pupil's task deficits. Instruction in turn, is followed by evaluation to assess the extent to which the child has attained the prescribed objectives. When these objectives have been attained, the pupil proceeds to the next sub-set of objectives and the teaching/testing cycle resumes.

Evaluation in the task analysis approach

The role of evaluation or assessment in the task-analysis approach is a major one. It is used to determine the current skill behaviours of the child and measures individual progress (at regular intervals) by indicating which skills have or have not been mastered. It identifies those additional experiences necessary to achieve mastery of instructional objectives as well as indicating the appropriate skill status necessary for entry to progress in the next highest level of the study skills.

Criterion-referenced tests are valuable for use in this kind of assessment in that they measure individual student progress towards explicit objectives by assessing the degree of mastery of material taught and learned in a specific time frame, and they also identify those additional steps or experiences necessary for mastery.

Consequently they are more appropriate in the task analysis approach than are the commonly used normative tests which evaluate the child's performance in terms of standards reached by other children. The Domain Phonics Test which covers a range of objectives in the phonic analysis area is one example of a criterion-referenced test of reading.

A complete design using the task analysis approach is the **Wisconsin Design for Reading Skill Development** which has four fundamental purposes:

"1. Identify and describe behaviourally the skills which are essential to competence in reading.

2. Assess each individual pupil's skill development status.

3. Manage instruction for children with different learning needs.

4. Monitor each pupil's progress."

(Otto and Askov, 1972)

The skills regarded as necessary in the Wisconsin Design are :

Word Attack
Comprehension
Study Skills
Self Directed Reading
Interpretive Reading
Creative Reading

A listing of these skills then leads to a statement of objectives. These objectives specify the behaviour required from the pupil in order to show he has mastered the appropriate skill. An example of one of the skills, some of its sub-skills and their corresponding objectives, is shown in Figure 2.

LEVEL C

2. Has Phonic Analysis Skills

a. Consonants and their variant sounds
Objective: Given words containing variant sounds of c, s, and g (e.g. cake-city, sit-trees, go-giant), the child indicates whether the underlined letters in given pairs of words have the same or different sounds.

b. Consonant blends
Objective: Given real or nonsense words beginning with the consonant blends st, sk, sm, sp, sw, sn, the child:

- **identifies the two letters that stand for the initial blend in words pronounced by the teacher; or**
- **identifies words that begin with the same blend as a stimulus word pronounced by the teacher and**
- **pronounces words that begin with the listed blends.**

Figure 2; Skills and Objectives (Otto and Askov, 1972)

The second step is to assess the individual pupil's level of skill mastery by using test items based on each objective.

The third stage is concerned with the management of instruction so that all the children are given a programme suitable for their different developmental needs.

Finally, each pupil's progress is constantly monitored.

The management of the overall reading programme in a school or classroom requires that modifications be made according to the needs of different children. The developmental programme caters for the normal child who moves through a skill development sequence without problems. The pace of the instruction may be accelerated or slowed down to fit the needs of either fast or slow learners, hence the accelerated instruction and adapted instruction groups.

Other groups of children who are not slow learners but who need additional help may receive either corrective or remedial instruction. Corrective instruction is designed to eliminate gaps or minor deficiencies in reading skills. Remedial instruction is reserved for those pupils with severe deficits not caused by limited intellectual ability.

When an overall reading programme is designed in this way it breaks away from traditional grade levels but instead it is guided by the pupil's attainment levels, learning rates and requirements for additional help. Although this particular design is concerned only with reading skills, the same principles may be applied to programmes in other areas.

The Wisconsin programme starts off by giving an initial assessment to all the children. The test items are based on the specific skill objectives. After these tests have been scored and the skills mastered have been noted, the Word Attack profile cards are notched for each child according to his results. If a child has been tested at level C because he has all the A and B level skills, his card will be notched next to the skills which he has mastered at this level.

Since he has the A and B level skills, the holes marked "all A skills" and "all B skills" will also be notched open. The cards may then be separated according to difficulty level by running a skewer through the appropriate holes. First the skewer is passed through the A level hole. The cards that stay on the skewer belong to children working at level A. The procedure may then be repeated by passing the skewer through the successively higher levels.

In this way a large number of children can be efficiently allocated to the different reading programmes (Figure 3). A set of objectives specifying the reading skills required is determined for the entire class or school. It is then modified with regard to its range, both for the accelerated and for the adapted programmes. A sub-set of objectives is also chosen on the basis of the needs of those in the corrective and remedial groups.

Children with specific learning difficulties who will be allocated to the remedial programme will now be set objectives to be attained over a short period of time.

By setting a small number of objectives to be achieved in a short period of time, there is a greater chance that the pupil will be successful. This is important for all children but especially so for those who have had a long history of failure.

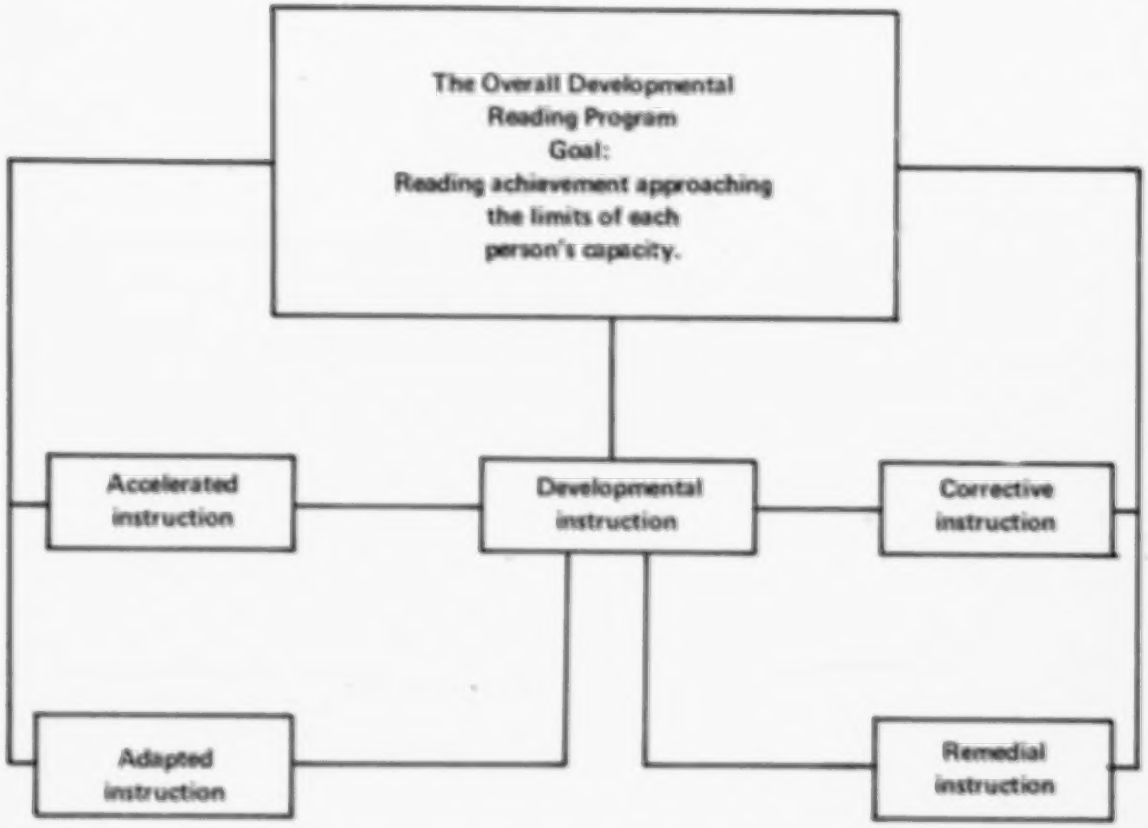

Figure 3. Overall Reading Program

(adapted from Otto and Askov, 1972, p.54)

The next stage is the implementation of the teaching programme. A feature of the design is that it encourages teachers to build up a resource file of material keyed to the teaching of specific objectives. This file can be augmented by teachers in a group and contain relevant material of all kinds - worksheets, audio-visual materials, parts of commercial programmes and a reference list of appropriate pages of readers and work books. It is at this stage that some adaptation of the task-referenced style of prescriptive teaching seems desirable for the remedial programme. It may be expected that information gained through the use of some of the older diagnostic-remedial procedures can make the implemented programme more effective. A better result may be obtained if for instance the teacher knows that a child's diagnostic profile shows severe deficits in auditory areas. She could then modify her presentation of material and the child's practice accordingly.

Once again assessment focuses on mastery of skills. The test questions ask the child to perform in a way that will demonstrate whether or not he has mastered the set objectives. The major intent is to measure individual progress and identify any additional sub-skills which may be required for complete mastery. If the child has attained the required objectives, he will be assigned the next set of objectives.

The kind of questions which should be asked if the child does not attain mastery of the objective include:

(a) Does he require more practice? Practice is very important for the specific learning disabilities' child if he is to retain new learning.

(b) Should the skills analysis be revised? Are the steps too large?

(c) Is more diagnostic information required concerning the child's abilities?

(d) Were the materials and methods adequate? With this in mind Engelmann (1967) criticized the attitude which assumes that " .... If the children succeed, the programme is responsible; if they fail, the children are responsible." The teacher must be prepared to critically examine her own effectiveness.

(e) Most importantly, look at the type of rewards and reinforcement which the child received. If children are learning slowly and putting forward a great deal of effort, tangible rewards may be the most effective at first. In all cases, it is important to reinforce correct responses by repeating the response, and by praising the child.

Perhaps the outstanding contribution which the task analysis approach can make to remedial teaching is its insistence on the systematization of objectives. So often, the teacher has only the global aim in mind of raising the child's reading age. And too often methods are selected prior to determining what the child should be able to do at the end of the programme. This is not only illogical. It is inefficient.

Systematization may also serve as an encouragement to the child. Clearly defined objectives provide him with recognizable goals and help him to know exactly what is expected of him. This gives him a sense of purpose while progress through the goals reinforces his confidence and self-esteem.

Since the child with learning disabilities has had more than his share of failure with academic tasks, he values success and reward more highly than other children. This is why a prescriptive programme which can manipulate success through the mastery of a series of small well-planned steps can be effective. Precisely defined objectives also provide a clear basis for communication with parents and other teachers about the child's progress.

It must be recognized, however, that not enough is known about the total reading process for all its sub-skills to be unambiguously defined. This means that we are still likely to find that prescriptive teaching based on task

analysis will not be the complete answer for teaching those children with severe learning disabilities. There will be a greater possibility of success if knowledge gained from the individual child's diagnostic profile is used to modify the instructional presentation. In this way, prescriptive teaching can become a matching of two profiles, one related to the learner's abilities and the other to the requirements of the educational task.

* * * * * *

REFERENCES

BATEMAN, B.D. *The essentials of teaching.* San Rafael, California: Dimensions Publishing Company, 1971.

BLOOM, B.S., HASTINGS, J.T., & MADAUS, G.F. *Handbook of formative and summative evaluation of student learning.* New York: McGraw-Hill, 1971.

COHEN, S.A. Studies in visual perception and reading in disadvantaged children. *Journal of Learning Disabilities,* 1969, 2 (10), 8-13.

ENGELMANN, S. Teaching reading to children with low mental ages. *Education and Training of the Mentally Retarded,* 1967, 2, 193-201.

MANN, L. Psychometric phrenology and the new faculty psychology: the case against ability assessment and training. *The Journal of Special Education,* 1971, 5, 13-14.

OTTO, W. & ASKOV, E. *The Wisconsin Design for Reading Skill Development: Rationale and Guidelines.* Minneapolis, Minnesota: National Computer Systems, 1972.

PETER, L.J. *Individual instruction.* New York: McGraw-Hill, 1972.

* * * * * *

CHAPTER 8

A DEVELOPMENTAL APPROACH TO IDENTIFICATION AND TREATMENT OF CHILDREN WITH MINIMAL CEREBRAL DYSFUNCTION

Yvonne R. Burns
(Physiotherapist-in-Charge, Queensland Spastic Welfare League)

The problems faced by a child who has inadequate or inaccurate mechanisms of sensory input, integration and performance are now well recognised, but unfortunately, it is in the child who is attempting to establish the highly integrated functions of posture, movement, vision and audition required to achieve the skills of reading, writing and expressive language that the problems become obvious. By this time many have experienced frustration and emotional setbacks as a result of their inability to cope with normal environmental experiences. With very early identification, assessment, and treatment, it is hoped to prevent many of the secondary problems as well as to alleviate the fundamental problems.

What are the bases on which skills and percepts are built? How does dysfunction of these basic processes contribute to the resultant problems? How can they be assessed and treated?

The problem

If a child's concept of his own body, its parts, its position, or the space it occupies, is disordered, then the movement of the body through an environment filled with objects, changing sequences, surfaces and visual clues, becomes a hazardous journey. If he lacks the efficient postural mechanism by which he can constantly relate himself to gravity, the earth and himself, then all motor activities will be carried out with difficulty as movement depends on a stable postural basis.

If visual information, which later becomes the dominant sense, is disturbed by field defects, unco-ordinated eye movements, squints, or lack of visual fixation, then spatial concepts, postural orientation, attention to the specific, will be wrought with problems and anxieties. The problem, however, is not only of sensory input but involves the organisation and integration of this input, then the selection and performance of the appropriate response. Observable manifestations may include such obvious items as clumsy poorly co-ordinated movement, direction and spatial confusion, inability to cross-the-midline, difficulty to copy position, inattention, hyperactivity, hypo-activity, inappropriate responses, abnormal fears, exaggerated defensive mechanisms, and disorganisation of expressive responses.

Developmental concepts

As early as 1947, Arnold Gesell (1947) drew attention to the intertwining of the sensory-motor skills of the infant. Later Piaget (1963) emphasised

the use of ready-made reflex responses in the newborn, followed by the sensory-motor learning between one to three months with what he called circular responses (see-reach-touch), followed again by the six to seven month stage when the child causes an event to occur. Kephart (1966) is particularly recognised for his emphasis of the fact that the skills necessary for educational processes were based on the orderly development of motor patterns, and he drew attention to the importance of awareness of body parts, position and space. However his programmes of remediation depend heavily on acquired motor patterns, "splinter" skills and cortical compensation.

Denhoff (1969) in his discussions of the neurologically deviant child, drew attention to the behaviour manifestations found in infant monkeys who have been deprived of oxygen for varying lengths of time, which were almost identical with those of deviant human infants, i.e., fear of height, clumsiness, impaired balance and disturbed gait.

Recent work by neurophysiologists theoretically supports the processes of interaction and interdependence of information from sensory modalities. Supported by this work, Jean Ayres (1972) hypothesizes that "the development of sensory integration follows a hierarchy involving all sensory systems". She further expounds that one result of integration is perception. Intersensory association and integration are dependent on adequate communication between different parts of the brain, including communication between the two cerebral hemispheres. The most significant area of intersensory integration is the brain-stem, including the reticular formation, the thalamus and other mid-brain centres and nuclei. The brain functions as a whole, one structure being dependent on the other, i.e., the higher levels being dependent on the lower.

It has been shown experimentally that a certain amount of tactile stimulation is essential to maintain the organisation of the brain. The tactile system is even more significant as it is the most mature system at the time of birth. The vestibular system also provides the infant with information regarding the relationship of his body to the environment. Stimulation of one sensory modality may enhance the efficiency of function of another. It has been found that a child with disorders of tactile sensation often has a craving for it, and bombardment of the general tactile system at the brainstem level will influence other areas of the brain including increased integration at the cortical level. It seems likely that the visual, oculomotor, proprioceptive, simple postural and locomotor responses, mediated largely through the brainstem, tend to function together. Consequently a defect in the earliest sensory information processes has the ability to affect all later developing systems.

A keen observer of the development of perceptual and motor responses in the newborn infant was the Frenchman Andre Thomas (1960). He regards movement in the infant as existing on a continuum beginning in the life of the foetus. The initial stimulation of the foetus is tactile in origin, coming from the pressure of the mother's abdomen, and contact with his own body parts. Reflex movements occur in response to these stimuli and build up to the readily recognised behaviour and motor responses of the newborn. Such patterns, as the walking reflex, which Thomas showed as being capable of adaptive processing, are present in the first week of life, i.e., stepping over an object placed in front of the foot. Once again, it is recognised that factors interfering with

development at or before birth would affect the nature of these responses and their integration, the basis for the development of all normal motor patterns.

A sequential rationale could thus follow:- Stimulation before birth is mainly tactile, while soon after birth there is increased tactile and oral stimulation. By three months the vestibular and visual areas are playing an important role, with gross proprioceptive and auditory awareness coming more into the picture. Tactile areas at this time are becoming even more efficient receptors. By six months the vestibular reactions are very strong (Landau reaction, "righting" reactions, and protective responses), and are supported by strong proprioceptive input. Visual localisation is also good. The proprioceptive areas receive much reinforcement through the bouncing and gross body movements that delight the baby at this age.

About nine to ten months, integration has reached the stage where visuomotor responses are possible (see-reach-grasp), and a stable postural background allows the child to move his body from one plane to another and to raise the centre of gravity (e.g. to assume sitting and to crawl). By twelve to fourteen months the child has enough knowledge of himself to allow participation in the surrounding environment; however, at this stage all space is relative to himself (i.e. the distance he can reach, the space he occupies when climbing in or under, and then the distance between himself and an object). During the next twelve months, integration and association of information from all basic areas helps the child to develop spatial relationships between objects without reference to himself. So by two years the use of cortical areas can organise and select appropriate information, to make consistent space judgements (objective space), which in turn allow a freedom of movement through the environment.

Early identification

At the Department of Developmental Neurology, Groningen, follow-up studies have been carried out on a large number of babies examined in the neonatal period. These studies showed a high correlation between newborn neurologically deviant babies and deviant pre-school (4 years) and school-aged (8-10 years) children, (Prechtl, 1965).

Another seven year study was carried out on children all born in Rhode Island in 1961 (Denhoff, Hainsworth, Hainsworth and Myklebust, 1971). Two preliminary neurological indices were carried out, by rating items of the pediatrician's neurological observations and defects both at birth and accumulated in the first twelve months. In 1968-69 these children were retested on several psychological assessment scales and the following tentative conclusions drawn:

1. As much attention ought to be paid to careful descriptions of behaviour and function in the newborn as to the search for etiology.
2. Carefully weighted pediatric observations correlate significantly with psychoneurological function seven years later.
3. Composite indices are better indicators of the "at risk" infant, and his later development, than single measures of either stress or outcome.

4. Early tagging of stressed or neurologically suspect children could have great value in pointing to the need for a programme of developmental stimulation to possibly reduce the incidence of inadequate function and achievement at school age.

Rationale of approach to assessment and treatment

During our (Burns and Watter, 1971) assessment and treatment of babies with delayed or abnormal development, it was often apparent that the child's problems were associated with abnormal awareness of his body, its parts, its position and an awareness of the space through which it moved. Many of the same problems were apparent in a more complex form in the older children with the so-called "perception" problems. These body awareness problems caused a lack of planned movement, often fear, and an inability to profit from or cope with the experiential environment. On the basis of our experience we have endeavoured to group these basic motor reactions to certain situations under five main areas. Our assessment then involves careful clinical observations of the child, not a formal test. As far as possible we use tasks or behaviours which have been normalised by researchers in other fields, as occurring within a certain age range in the general population. The method therefore can be adapted for use at any age (1 day - 24 weeks - 6 years - 16 years) by raising the level of the tasks. This versatility also permits its use in the assessing of physically or mentally handicapped children.

The whole approach is a background to the more symptomatic approaches of assessment, not a substitute. The scheme is based on a neurological developmental method and there is a reasonably logical sequence of events.

As already mentioned the first responses of the child are largely tactile, followed by vestibular and visual, then as the ability of the child to adjust becomes stronger, allowing weight to be taken momentarily, proprioceptive input is added. At the same time movement, although largely reflex and automatic, is occurring, giving kinaesthetic feedback. As the input from each area increases in quantity, the child develops responses to that input, be it tactile, visual, auditory, oral proprioceptive, vestibular, painful, enjoyable, effective or ineffective, and so a quality of response develops. The primitive grasp reaction modified, until suitable for fine crochet, the reciprocal aimless kicking streamlined to the finest ballet movements. Hence this sequential developmental rationale of assessment and treatment is based on the importance of low level systems involving integration, feedback, and servo-mechanisms, for basic automatic response. These responses may themselves stimulate, but also be modified by higher levels.

Motor planning, which is the ability to plan economic and efficient movement patterns appropriate to the situation, relies heavily on these lower level responses but also requires high level cortical function:

(a) in the selection of appropriate information,

(b) the organisation of this information,

(c) the persistence or constancy of matter,

(d) the memory of previous experience.

These complex responses are those so often used in the symptomatic assessment and hence the difficulties experienced in differentiation of symptoms.

Assessment - with discussion and task examples

As the theme of this paper implies, there are often signs of "Minimal Cerebral Dysfunction". These so-called "soft" neurological signs are evident in children having apparent "perception" problems (both "soft" and "perception" being wide non-explanatory cover terms). It is important to take heed of the warning of Touwen and Prechtl (1970), "The classical adult neurological examination is of little use to test the dysfunction of a developing neurological system".

Assessment

1. Evaluation of the presence of specific signs of cerebral damage, or dysfunction.
2. Test for the persistence of primitive patterns of movement and posture that should be integrated.
3. Test for the establishment of the appropriate sequential postural and balance reactions.
4. The effect of (2) and (3) in particular developmental positions and movements.
5. Awareness of body parts, awareness of body position and awareness of body space.
6. Motor planning involving the ability to copy position and perform appropriate voluntary tasks.
7. The ability to perform skills involving speed, balance, rhythm and direction and the ability to learn new tasks.

It is important to record the behavioural level of the child (e.g. deep asleep, restless sleep, awake and happy, distressed) during the assessment as this will affect the response. In the infant under three months it is imperative as the "state" will drastically alter the muscle tone and therefore the quality of reflex response (Lenard, Bernuth and Prechtl, 1968).

Test and task examples

As those present at this seminar are mainly concerned with, and have knowledge of, school-age children, I will endeavour to approximate recognisable signs and task levels for this age group with passing reference to the younger child.

1. Some of the specific signs that may be noted are the presence of *involuntary movement or tremor, synkinesis (mirror movements), abnormal muscle tone, abnormal or primitive movement patterns, and hyper- or hypo-reactivity to stimuli.*

2. This leads one to test for the persistence of *primitive reflex reactions*. These may be manifestations of the tonic reflexes, e.g. the *asymmetrical tonic neck reflex*, normally integrated by the fifth month, may be seen in the extension of the facial arm and flexion of the occipital arm when the head is turned, during postural holding positions. Another example is the persistence of the *tonic labyrinthine reaction*, making it difficult for a child to maintain total extension of trunk and limbs while lying prone (on the tummy). These reactions are largely integrated by the development of *postural and balance reactions* (Bobath, 1968). Postural reactions not only integrate the former but provide the basis for a total body schema.

Without a mature postural mechanism the child has no chance to perform highly co-ordinated movements.

3. The ability to adjust the head to gravity, the head to the body, and body to itself are called *righting reactions*. The child then learns to maintain *total postural extension* (6 months) followed by the ability to protect the body when falling by extending the arms or the legs. The child with poor *righting* may be noticed by his inability to hold a stable postural position, or to maintain an upright head position while concentrating on other tasks. Movement may look awkward and lack a smooth rhythmical flow from one position to another. Each *righting reaction* is tested separately. The *equilibrium reactions* are the highest level of postural reaction and are those reactions enabling *controlled balance*. Rather than protect the body as it falls (protective reactions), the *equilibrium reactions* prevent the fall occurring by counteracting the disturbing force. The child who keeps falling over, or who cannot perform standard balance activities, may have a lack of development of these reactions.

4. The reactions and function of the child in different positions indicates the *level of maturation of posture* (areas 2 and 3) and *level of sensory integration*, e.g. crawling pattern, maturation of sitting posture and gait.

5. Awareness of body parts seems largely dependent on tactile information. Reaction to tactile stimulation may range from positive *rejection* and *avoidance*, to *ignoring* of a part, *finger agnosia* (inability to distinguish which finger has been touched) and *astereognosis* (inability to distinguish differing shapes in the hand). The child with finger agnosia will be clumsy and the more so when not watching what he is doing - the child who loses the food off his plate, the child who can't hold his pencil firmly. I wonder if it is like having a pair of gloves on the hands?

Awareness of body position must rely on the above but also on proprioceptive and kinaesthetic information from joint and muscle tension, to give the required information for awareness of the changing relationships that can exist between each body part; e.g., the child who tries to hide but leaves his legs sticking out, the child who has to look to see if his feet are straight, or the child who cannot curl up small, make a bridge, etc. (may be associated with apraxia). The older child is tested for *position agnosia*, while in the younger child rather subtle use is made of certain body positions.

Awareness of body space relies on the above two areas but also on vestibular and on visual input. Without a true concept of one's own body space, there is no standard by which to relate the distance, size and position of objects relative to one's self, or relative to each other. The contribution of vision in spatial orientation is enormous, so it is essential to know if the child has binocular vision, vision in all fields, convergence, a normal nystagmus, the ability to track or eyefollow from one field to another (cross the midline), and the ability to hold or fixate on a particular point.

Spatial problems may be a cause of clumsiness in a child who misjudges the position of objects, or the speed of an approaching ball, he may step off into space from a table or step, have excessive fear or absence of fear of heights. An accurate space concept is also necessary for the recognition of the persistence of matter, despite a change in its position, lighting, or even occlusion from sight. Tests involve those for *vestibular postural reactions* including *righting reactions* with sight occluded, eye control, and note is taken of any compensatory actions being used to build up input, e.g. verbalisation or tapping.

6. *Motor planning,* or the ability to plan and carry out economic efficient movement involves all that has been previously discussed plus the high level cortical functions. For a clear estimation of problems in this area it is necessary to test non-habitual tasks as *splinter skills* and response sets can be learned. The presence of gross motor and fine motor *apraxia* is tested. (Motor apraxia is the inability to perform a movement even though its nature is understood and the physical ability to perform the movement is present.)

The necessary planning to do puzzles and manipulative tasks such as writing, requires a very high level of integration and feed-back. The child who is experiencing difficulty in motor planning may be unable to carry out a simple task, play "Simon Says" or he may go the long way round, or lose his way. Another child may keep changing the hand he uses (sometimes using right hand on right side, left hand on left side, a crossing-the-midline problem). Inability to dress often indicates apraxia.

7. It is hardly necessary for me to discuss the *skills* area as we can all think of problems in the area of learning and teaching skills. *Motor skills* involve rhythm, timing, spacing, speed, accuracy and co-ordination, and are the result of total efficient brain function. Once a skill is learnt however, it may be performed at a subconscious level such as the speed typing of an experienced and practised typist (a skill close to my thoughts now as I try to think, look, direct, touch, correct, and yet plan ahead, all at once with rather drastic results). This automatic skill is **NOT** the same as the subconscious automatic responses that we have been discussing, e.g. postural, and cannot replace them.

Tests would include, for the older child, rapidly alternating forearm movement, skilled balance, rhythmical body movement and rapidly changing physical tasks.

Treatment

A treatment plan would then logically follow the same sequential developmental pattern. However, because of areas of dysfunction within the neural system, the child cannot take advantage of "normal" environmental experiences to build up basic concepts. Therefore he needs more than just "practice" in daily basic activities, or "special" games, for in fact, these may lead him into more confusion.

The prone (tummy lying) position has special significance in postural mechanism development, and the integration of primitive patterns. Before bipedal balance is attained, anti-gravity responses are necessary. "From the phyletic standpoint it is reasonable to assume that most postural mechanisms evolved when the normal non-resting position of the body was prone or quadrapedal, as opposed to supine" (Ayres, 1972). Many of the primitive responses are pro-gravity, and in our experience many of the postural reactions in prone are often weak or absent in these children, even at the age of 5-6 years (Burns and Watter, 1971). Infant "prone" positioning does facilitate developmental progress.

All handling, positioning, techniques to increase awareness, and motor planning are introduced as or during pleasurable meaningful activities.

Where there is hypersensitivity to an input, then careful grading of that input is used and other forms of security are given during the stressful situation. For example, withdrawal from and distress caused by tactile contact on the hands would be treated by the use of a low sensitivity medium such as water or self-touching at first, while during the activity much praise and physical and emotional support would be given.

The importance of general tactile and vestibular input for sensory integration has been discussed. The tactile may be given with towelling and handling, etc. Vestibular responses may be improved by swinging, bouncing and in particular twirling (as in a rope swing or hammock). Ayres-type scooter boards can develop better prone reactions while at the same time influencing the labyrinth. The child who spins everything or himself when upset has been found to show considerable positive response to spinning.

Proprioception may be heightened by increased weight, by tapping, and bouncing, with an improved postural stability resulting. Kinaesthetic stimulation seems to depend largely on the muscle tone and the muscle spindle activity (gamma nervous system).

The co-ordination of the eye movements and visual responses may be improved by eye follow and tracking. It is important that the swinging object crosses the midline and that outer as well as inner fields are used during the activity. Where there is poor visual integration it may be necessary for the child to compensate by verbalisation about the situations, tactile localisation through tapping or touching, or use other extra-sensory modalities. This compensation which usually helps the child clarify his situation may often be wrongfully interpreted as hyperactivity, irrational nervousness or even naughtiness.

During activities to improve spatial awareness it is important that varying angles, directions, and depths are introduced, but just as or even more important is the effect of different lighting, and different surroundings. In a room the child may gain many clues for orientation from the horizontal and vertical building lines, so a time spent outside could be profitable. Dark corridors, and open doorways in an otherwise blank wall, can add to the child's difficulties with visual space.

Tasks involving position copying, both with and without verbal instruction, direction finding, pattern copying and problem solving activities, may be used to improve motor planning. Ball kicking, hitting, and swinging arms to alternate sides can all be used to "cross the midline".

Skills aiming for speed, rhythm, agility, balance and co-ordination may be improved in most sports and dancing, also jumping a moving rope and trampolining. Fine motor hand skills are of particular importance for the school child. The innumerable activities found in every pre-school can be helpful in building up these skills.

Many "treatment" programmes involving motor tasks and activities for children with specific learning difficulties, have been tried with varying claims of success. Some programmes have been thoroughly evaluated as to their effectiveness, while others have undergone little or no investigation.

However there are three programmes that I would like to mention here as I feel they have some value in their approach.

Dr. Jean Ayres, in her book, *Sensory Integration and Learning Disorders* (1972), directs activities and aspects of treatment to sensory integration, emphasising the tactile and vestibular input, postural reactions, eye - hand co-ordination, balance and competent motor activity. Her experience has been with 6-8 year old school children but most activities are suitable for the younger child.

Basic Abilities (LeGay Brereton and Sattler, 1967) programme is a useful extension of the more basic techniques already described. This programme has been designed for pre-school and school entry Cerebral Palsy children, but is very applicable for most 3-6 year olds, particularly those who have difficulty in profiting from their play and environmental situations. The developmental sequence of the programme can be followed by noting the six main levels for achievement:-

1. Obtaining information from touching things.
2. Appreciation of body position.
3. Appreciation of distance and the order of things.
4. Planning the movement appropriate to the situation.
5. Obtaining information from visual stimuli.
6. Selecting objects for attention.

A third programme is one aimed to help build up the spatial awareness of the visually handicapped child (Cratty, 1971). Cratty and his colleagues have developed several remedial programmes based on developmental task sequences with physical activities closely linked with cognitive functions. One such programme is set out in the book *Developmental Sequences of Perceptual Motor Tasks* (Cratty, 1967).

Review

Over the past decade "Minimal Cerebral Dysfunction" has received much attention, especially in relation to the learning and performance abilities of school children.

Quite early, the importance of motor development was recognised as the basis on which concepts for learning were built. More recently this motor development has been analysed in greater detail and in a wider context, so that the significance of various phases gained importance, particularly the quality of primitive and automatic responses.

Although little mention has been made in this paper of the difficulties associated with audition and communication through language, the extreme importance of assessment and treatment in this area is acknowledged.

In the detailed developmental neurological assessment all aspects should be fully assessed and the programme of management planned by those experienced in this field. Particularly in the case of young children, I feel that the parents are the most important "educators", so it is essential that they understand the underlying problem and the specific aims of each part of the programme.

Conclusion

From experience gained in assessment and treatment of children of all ages, we have found that basic reflex, postural and motor reactions can be analysed in detail, giving a reasonably clear idea of the basic areas of deficit, and that a logical programme of management can be carried out. The success of this programme has only received subjective evaluation as yet, in the specific gains of each particular child. Ideally, treatment and home management is begun as soon as developmental delay is evident and for the best results this is between 1 and 36 months.

In this paper I have endeavoured to identify the problem, give the background for a developmental approach, then outline the process of assessment and treatment as a Physiotherapist.

* * * * * *

REFERENCES

AYRES, A.J. *Sensory integration and learning disorders.* Los Angeles: Western Psychological Services, 1972.

BRERETON, B. LeGay, & SATTLER, J. *Cerebral palsy: basic abilities.* Mosman: N.S.W. Spastic Centre, 1967.

BOBATH, B. *Abnormal postural reflex activity caused by brain lesions.* London: Heinemann, 1968.

BURNS, Y., & WATTER, P. Developmental perceptual motor disorders. *Australian Journal of Physiotherapy,* 1971, *17,* 85-95.

CRATTY, B.J. *Developmental sequences of perceptual motor tasks.* Freeport, New York: Educational Activities, 1967.

CRATTY, B.J. *Movement and spatial awareness in blind children and youth.* Springfield, Illinois: Charles C. Thomas, 1971.

DENHOFF, E. Motor development as a function of perception. In *Perceptual Motor Foundations.* Washington: American Society for Health, Physical Education and Recreation, 1969.

FLAVELL, J.H. *The developmental psychology of Jean Piaget.* Princeton, New Jersey: D. Van Nostrand, 1963.

GESELL, A. & ARMATRUDA, C.S. *Developmental diagnosis.* New York: Paul Hacker, 1947.

KEPHART, N.E. & ROACH, E.G. *The Purdue perceptual motor survey.* Colombus, Ohio: Merril Books, 1966.

LENARD, H.G., BERNUTH, H. Von & PRECHTL, H.F.R. Reflexes and their relationship to behavioural state in the newborn. *Acta Paediatrica Scandinavica, 57,* 1968, 177-185.

MYKLEBUST, H.R. (Ed.) *Progress in learning disabilities,* Vol. II, New York: Grune & Stratton, 1971.

PRECHTL, H.F.R. Prognostic value of neurological signs in the newborn. *Proceedings of Royal Society for Medicine,* 1965, 58.

THOMAS, A. & AUTGAERDON, S. *Locomotion from pre- to post-natal life.* Clinics in Developmental Medicine, No. 24. London: Heinemann, 1966.

TOUWEN, B.B. & PRECHTL, H.F.R. *The neurological examination of the child with minor nervous dysfunction.* Clinics in Developmental Medicine, No. 38. London: Heinemann, 1970.

* * * * * * *

CHAPTER 9

QUEENSLAND PROVISION FOR CHILDREN WITH LEARNING DISABILITIES: PERFORMANCE AND PROMISE

G.F. Berkeley
(Director, Special Education Services, Queensland Education Department)

For many decades teachers have been confused by those children who, on the face of things, are too bright to be mentally retarded and too much in touch with the realities of life to be deemed emotionally disturbed, and yet fail to make progress in the basic school subjects. The standard lock-step programs of schools in the past have only exacerbated the problems of such children. With the current emphasis in the schools on individualizing instruction many children have been salvaged. But there are still some who fail to respond to programs in the regular schools.

Readers in the field of learning disabilities may well be daunted by the bewildering array of terminology used by the many "experts" in various parts of the world to describe these children. Since the pioneer work of Strauss and his colleagues beginning with the publication of Strauss and Lehtinen's "Psychopathology and Education of the Brain Injured Child" in 1947, there has been a long list of publications, papers and propositions. The child with learning disabilities has become the subject of numerous conferences, seminars and conventions.

Special educators in the Queensland State Department of Education have considered the usual array of descriptive labels. These have included terms such as psychoneurological, neurodevelopmental, dyslexia, aphasia, dysgraphia, minimal brain dysfunction, specific learning difficulties, educational handicap, perceptual handicap and learning disability. We have decided to use the term learning disability to describe the condition. This is a simple term under which can be subsumed the range of disorders from which children in this category may suffer.

In searching for an adequate definition of learning disability, we were guided by investigations conducted in the U.S.A. There, various conferences and task forces have, in the past decade, attempted some clarification of the nature of the problem by formulating definitions. Of these, the most succinct and serviceable definition appears to be that provided by a National Advisory Committee to the U.S. Office of Education in 1968.

"Children with special learning disabilities exhibit a disorder in one or more of the basic psychological processes involved in understanding or in using spoken or written language. These may be manifested in disorders of listening, thinking, talking, reading, writing, spelling and arithmetic. They include conditions which have been referred to as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, developmental aphasia, etc. They do not include learning problems which are due primarily to visual hearing or motor handicaps, or to mental retardation."

Once the nature of the problem has been defined, the educational administrator is faced with the problem of planning appropriate provision for a particular handicap. One of the difficulties in planning services for learning disabled children has been caused by the very nature of the disabilities from which children suffer. These disabilities range along a continuum of severity. In fact, it could be said that the bulk of our school population suffers from learning disabilities of one sort or another. What the educational planner needs to know is the approximate percentage of school age children whose learning disabilities are such that they make at best minimal progress in the regular classroom, particularly in that most important skill area - reading. Where the regular schools are successfully catering for individual differences, the incidence of severe learning disability may be equated with what could be called the "hard core" incidence. Where schools are not individualizing instruction, those children with moderate or even mild learning disabilities may join the hard core as the hardened core.

Incidence

All over the world there has been a wave of emotionalism and unclear thinking in this relatively new area of special education. Incidence figures range from 1% to 40% depending on the definitions used and the predilections of the people concerned. One authority refers to incidence figures as "guesstimates". Myklebust is reported as saying, "Tell me how many you want to find and I'll write you a definition that will find that many."

The Guidance and Special Education Branch of the Queensland Department of Education has conducted surveys in provincial cities to select children for remedial teaching. These were not comprehensive surveys in that the children comprised only those referred by teacher. Guidance Officers individually examined children referred and then decided in the light of all available information whether the children required specialist attention or not. Those selected for treatment, undoubtedly included the hardened core, the hard core, and those who were culturally and socially deprived. In all cases, the incidence was approximately four per cent. However, it must be remembered that these surveys could well have excluded some children in need, as the number of referrals would have reached 10% of the school population. Furthermore, some of the children selected for treatment were not necessarily learning disabled but rather retarded in schoolwork as a result of poor teaching, frequent changes of school or some other reason or complex of reasons.

Experienced senior officers of the Guidance and Special Education Branch who have been involved in both selection and treatment are of the opinion that the hard core of learning disabled children constitutes roughly 2 to 3% of the school population. Preliminary evidence from our grade 4 survey of the incidence of reading disability suggests that this is a realistic figure.

In 1972, the Department of Education commenced an extensive survey of reading performance at the Grade 4 level. The major aims of the survey were:

(a) to investigate the incidence of reading difficulties in a normal school population;

(b) to identify the nature and pattern of these difficulties; and

(c) to indicate the size and type of the provision required to cater for the problem.

It is also hoped that the results of the survey might suggest ways of identifying children with reading difficulties as soon as possible, and provisions for preventing these difficulties from developing.

A battery of reading and general ability tests were administered to a sample of some 3800 grade 4 children in April 1972. (This represented approximately 10% of the grade 4 population in State Primary Schools). Following an analysis of the results of this survey testing, two groups were identified for more intensive investigation. The first group represented "superior" readers, the second "retarded" readers. Reading superiority and retardation were defined in such a way that the effects of poor general ability were excluded.

Each group comprised some 50 children, who were matched with their counterparts in the other group on such variables as age, sex, general ability and reading attitude. In the third term last year, these children were given a series of individual intelligence and reading tests, the purpose being to identify with some precision the components of good and poor reading performance. The analysis of the results of this second stage testing is almost complete. However, it has been necessary to test an additional group of "poor" readers in an effort to determine more clearly the extent of retardation. Analysis of these results is still proceeding A full report of the study is now being prepared, and I would hope that it will increase our data base for more informed decision making on future provision for reading disabled children.

Types of Provision

There is no doubt that the majority of learning disabled children can be adequately educated in the ordinary classroon. There is no other single trend in education at the present time that worries me more than the tendency of some teachers to abrogate their true responsibility by the claim that all problems encountered in the learning process must be passed for solution to the specialist. Worry enough that art, music and physical education are increasingly being seen as the preserve of the specialist - much more worry that, when a child is not achieving at least the supposed mean level for reading, often after exposure to only one method or approach to learning to read, the cry goes out for the specialist.

We espouse the doctrines of individual differences and the individualising of instruction and yet see insurmountable classroom problems in the wide spread of achievement that must inevitably occur in any group.

Where teachers are equipped to recognize the danger signals, particularly in the early grades, classroom programmes can ensure some progress for most children. If these programmes are sufficiently flexible to meet the educational needs of the individual, if teachers are prepared to provide a wealth of learning experiences, and if they can accept and plan for a wide range of achievement in any age group many of the frustrations experienced by teacher and pupil alike should disappear. If the teacher has imaginatively and conscientiously tried to

help a disabled learner with little success, then it is probably time for the specialist, either in the full time or the sessional class to take over.

The grossly disabled learner is best catered for in a special, full time class where day by day tuition affords opportunities for intensive prescriptive teaching, over-learning, and emotional rehabilitation. As a general principle, the earlier identification and treatment can be instituted the better are the outcomes. Nevertheless, some remarkable successes have been achieved by placing the older child of ten or eleven years in a full-time class for a year or two.

Children with a moderate degree of handicap frequently achieve good results through sessional work. The danger here is that the benefits sometimes become encapsulated in the remedial setting. They may not transfer to the child's functioning in the regular classroom and may not continue once the child has been discharged from specialist attention. An attempt is made to avoid this situation by regular visits of the remedial teacher to the child's class teacher and by trying to involve the class teacher intimately in the planned remedial programme.

Current Provision

The first provision for learning disabled children in Queensland was made in 1959 with the appointment of a remedial teacher to two remedial centres in the Wynnum area. Since then, others have been trained, some at the Schonell Centre, some at the Guidance and Special Education Branch and some at Mount Gravatt Teachers' College, and the staff has grown to a total of 45. Twenty-five of these work in the metropolitan area and twenty in provincial towns. Children are treated at remedial centres on a sessional basis, usually attending two ninety-minute sessions per week. Every effort is made to keep class teachers apprised of the nature of the child's disabilities, the special programmes being undertaken, and the ways in which these programmes can be backed-up by classroom teachers.

In 1968, the first full-time class for children with learning disabilities commenced at Kelvin Grove State School. Other classes have been established at Greenslopes, Southport, Taringa and Kedron. In the main, these classes, each consisting of six children, are intended to rehabilitate the young disabled learner, preferably the five to seven year old, so that he can take his place in the regular classroom. The classes are attached to primary schools to permit integration with primary school activities, both intra- and extra-mural. Not every remedial teacher is equipped to take charge of one of these classes. What is needed is an experienced practitioner with the ability to act as program planner with ability to translate information from psychiatrists, neurologists, psychologists, speech therapists and others into realistic learning strategies.

The teacher must also be prepared to act as a counsellor, to support parents through their anxious moments. She must also be able to judge when her pupils are ready for integration with the regular school. Teachers of this calibre are rare people and this is one of the reasons for the small number of full time learning difficulty classes at present.

Future Provision

Remedial Centres and Learning Disability Classes have up till now been established wherever spare classrooms in primary schools are available. They have been provided with special furniture and in some cases carrels to facilitate learning. Materials and equipment are now being issued much more liberally than in the past. A variety of teaching aids and resource materials are being fed into the centres. Specially designed rooms to serve as Remedial Centres are now being planned. These will allow for individual and group pupil activity, wet activities, teacher preparation of material and adequate storage and power facilities.

Classroom teachers are becoming increasingly aware of the nature of the problems experienced by the learning disabled child. This has been brought about by attendance at Departmental seminars, by the guidance officer in his consultative role,by pre-service courses at Teachers Colleges. Guidance Officers, in particular, prefer to utilize the resources of the regular school where these are receptive to suggestion and advice rather than schedule the child for specialist attention. Deputy-Principals, Senior Mistresses and Infant Mistresses will be devoting a considerable proportion of their time to devising programs for the amelioration of learning disabilities. As preventive teaching in schools becomes more efficient, the specialist teachers will find that their clientele will probably consist more of grossly difficult cases.

The case load may well be reduced but the teaching tasks will become more formidable. More support services to the teacher of the learning disabled will be required. No one denies that the interdisciplinary approach is highly desirable. The psychiatrist, the neurologist, the guidance officer, the teacher, the occupational therapist, the speech therapist, the social worker and the parents are all part of the treatment team. Lines of communication amongst these people must be kept open and not only in the form of written communication. Assessment committees should be established and these committees should meet regularly to ensure that treatment - medical, para-medical, educational and para-educational - is tailored to the needs of the individual.

One of the difficulties which must be faced in the future is that of providing services for the remote areas of our vast State. In towns such as Longreach, Goondiwindi or Winton the school population is such that the number of disabled learners requiring specialist attention would be insufficient to keep a teacher fully occupied. The solution would seem to lie in the appointment of a resource teacher. This teacher would be a generalist in special education. She would be concerned with the learning disabled, the mildly mentally handicapped, the dull, the child with adjustment problems - in fact with any child who is failing abjectly in schoolwork. Small schools in remote areas would probably best be served by itinerant advisory teachers, well versed and trained in the techniques of prescriptive teaching. They would devise programmes for individual children, evaluate the effectiveness of these periodically, and be a means of bringing to remote areas the most recent advances in methods and materials.

Training of Teachers of the Learning Disabled

As our knowledge of learning disabilities experienced by children increases so does the need for more training for teachers working in this area. There is little doubt that the next ten years will see greatly expanded opportunities for teachers wishing to gain additional qualifications to teach the learning disabled. The Interim Committee of the Schools Commission is expected to make significant recommendations in this particular area as well as in the general provision for disadvantaged children of all kinds. We could well be on the threshold of a new era for the learning disabled.

* * * * * *